THREE ESSAYS IN APPLIED INTERNATIONAL MACROECONOMICS: CAUSES OF GROWTH AND STAGNATION IN THE 19TH CENTURY UNITED STATES

by

Nathaniel Turner Cline

A dissertation submitted to the faculty of
University of Utah
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Department of Economics
The University of Utah

December 2012

The University of Utah Graduate School

STATEMENT OF DISSERTATION APPROVAL

The dissertation of **Nathaniel Turner Cline**

has been approved by the following supervisory committee members:

Matías Vernengo	, Chair	**6/26/12** Date Approved
Thomas N. Maloney	, Member	**6/26/12** Date Approved
Rudiger Von Arnim	, Member	**6/12/12** Date Approved
Al Campbell	, Member	**6/26/12** Date Approved
Tracy Mott	, Member	**6/26/12** Date Approved

and by **Thomas N. Maloney**, Chair of the Department of **Economics**

and by Charles A. Wight, Dean of The Graduate School.

ABSTRACT

This dissertation is composed of three essays on U.S. macroeconomic development in the 19th century. Its focus is on the role of international trade and finance in governing the pace and nature of domestic growth. I argue the balance of payments and the institutions that govern its development played a larger role in U.S. economic growth than is normally recognized.

The first essay of the dissertation lays the theoretical groundwork for the subsequent papers. Recent literature in the economics of growth has suggested that the main determinant of growth differences lies in institutions and the political process. Thus, "proximate" causes of growth are determined by more "fundamental" national characteristics like the structure of property rights. I argue instead that the developmental orientation of the state emerges as fundamental in U.S. history. Most importantly, the federal government's role in shaping and establishing financial markets and a common money of account allowed the U.S. to escape external constraints on growth related to the capital account.

The second paper tests the hypothesis that U.S. growth was balance of payments constrained. This paper provides estimates of the long and short-run import demand function. Structural break tests suggest a shift in import demand after the Civil War. This implies that over time, maintaining balance on current account became less relevant as a potential

constraint on growth. As a result, external events like terms of trade shocks and changes in British monetary policy seem to have less of an impact on growth in the latter part of the century. I explain this decline in the income elasticity of imports as the result of the active developmental state.

The final paper of the dissertation examines the economic crisis between the years 1837 and the early 1840s. While traditional narrative regards the crisis as a purely monetary event, it can alternatively be seen as a balance of payments problem following a common pattern among small open economies. I outline a model of assymetric balance of payments adjustment, which suggests that the pace of industrialization in England determines export prices and debt sustainability in the U.S.

"...from time to time history catches economists at their brilliant gymnastics and walks off with their overcoats."

- Eric Hobsbawm

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGEMENTS

I am grateful to the many people who participated in the creation of this work. I will remember my years at the University of Utah as a time of intellectual growth amongst a community of committed faculty and engaged peers. The path along which my own inquiries ran was laid by these generous individuals, but even more than individuals, the intellectual tradition at Utah provided the environment for a work of this nature. The fields of economic history, the history of economic thought, and classical political economy, which are essential to my own perspective, are cultivated at the University of Utah even as they become extinct at many other institutions.

My advisor, Matías Vernengo, has not only guided this work, but has provided me with a coherent and unified approach to political economy. I am grateful also to Tom Maloney who helped to spark my interest in economic history. Tracy Mott originally introduced me to heterodox approaches to macroeconomics and monetary theory, and has provided many helpful comments which have surely improved the following chapters. Discussions at various stages with Ethan Doetsch, Bill McColloch, David Fields, and Kirsten Ford were invaluable. Jane Knodell provided confirmation and encouragement for some of the ideas in Chapter 4, as well as some unpublished materials. I am also grateful to the commentators at the Western States Graduate Workshop and the Eastern Economic Association annual meetings to whom I presented various parts of this work. The students

which I have been fortunate enough to instruct heard many of the present themes and provided useful comments and questions. For the better parts of this dissertation, I can claim only partial responsibility, while its shortcomings are clearly my own.

The financial support of the economics department through teaching fellowship was invaluable. Of course, none of this would be possible without the help of the departmental staff, most notably Becky and Tracey.

A great deal is also owed to those who helped me retain what little sanity I had when I began this task. My parents provided early support of critical inquiry for its own sake, encouragement, and two sets of ears to complain to. Liz brought me back to reality at critical moments when I risked becoming lost in my own thoughts. Alex, Kell, Kris, and Paulo all made sure I didn't forget how to have fun. Finally, I owe my biggest thanks to Amanda whose love and support were of more value to me than she knows.

CHAPTER 1

INTRODUCTION

The present work is an attempt to explore the open economy in macroeconomics and the theory of long run growth in economic history. In doing so, I hope that it can build toward a reconstruction of what have lately been dubbed the "fundamental causes" of long run growth, and a return to broadly Keynesian economic history. The essential conclusions of the literature on long run growth and the "new" economic history suggest that a light, democratic state is the key to long run national success. This dissertation argues that the "liberal" state is a historical myth, one that arises from the core principles of Say's law and the marginalist theory of distribution. It will be argued here that a demand-led theory of growth and conflict theory of distribution fit the historical record more closely. These theories of growth and distribution reveal a world in which international conditions often dominate national, a point that is absent from most of the literature on long run growth.

More broadly, the lack of international considerations reflects a shift in the understanding of history and theory in several disciplines in the last 30 years. Revolutions that were commonly understood to be the result of structural conflict are now seen as the result of particular conditions. That is, had Louis XVI been more attentive, the French Revolution may

not have happened at all. Or, had King George not been so petulant, a bloody American Revolution would have been avoided. The abandonment of grand histories has been accompanied, in several disciplines, by the abandonment of macro-analysis in theoretical work. In economics, an enthusiasm for microfoundations and a move toward Walrasian equilibrium represented the victory of methodological individualism and the death of aggregates. The Keynesian revolution, long aborted in modeling, had finally been defeated methodologically. The whole had been successfully reduced to the sum of its parts.[1]

Thus, in addition to the theme of the role of international conditions in economic development, the three essays share a common methodological viewpoint. Underlying the analysis is a firm commitment to the notion that social systems should be viewed as irreducible wholes. Societies and economies must be understood as structured institutions. I thus agree with Myrdal (1976) who argued that, "in regard to practically every economic problem, scientific study must concern the entire social system..." Though there is interaction between the individual and social, this dissertation adopts the perspective of Marx (1967) who suggests that societies do more than constrain choice, they shape man himself. This notion cannot be captured with the now fashionable approach of methodological individualism.

The current approach falls within a tradition within economics dubbed "classical Keynesian" by Bortis (1997). This tradition is in essence a synthesis of the classical theory of income distribution and the Keynesian

[1]It is interesting to note Koffka's (1935) correction of the commonly used phrase, "the whole is more than the sum of its parts." He suggested instead that, "the whole is other than the sum of its parts." This captures more precisely the notion I refer to here. The notion that the whole has a different existence than the sum of the parts was a common feature of Gestalt psychology.

theory of output determination. For both Ricardo and Marx, income distribution is the primary issue in political economy. However, the determinants of distribution are found in the sphere of production rather than the market. Social and political influences then determine the normal costs of production which in turn determine normal prices. The Keynesian hypothesis suggests that long run growth is constrained by the evolution of autonomous demand and not limited by some natural or potential level of output. The distributional and growth considerations interact to the extent that distribution affects demand and vice versa. Defined in this way, classical-Keynesian political economy encompasses a host of traditionally heterodox authors and schools of thought.[2] As it deals with long run normal prices and long run effective demand, the methodology of the classical-Keynesian approach is particularly amenable to the question of historical growth.

Rather than viewing institutions as constraints on individual behavior, the classical-Keynesian approach suggests a concept of institutions as social phenomena. Thus, we can follow Schmoller in defining an institution as a "largely independent partial order of social life directed towards a definite aim which provides a durable framework for persistent action" (Schmoller, 1920 as cited in Bortis, 1997, p. 22). Institutions under the classical-Keynesian approach have a life of their own. They also have a "definite aim" which grants them intention. Thus, we must understand institutions as structures which, although they interact with individuals and have feed-back effects, have an independent existence from the individuals that participate in them.

Additionally, I have adopted Kaldor's (1977) perspective on the develop-

[2]Elements of Post-Keynesian, Marxian, Sraffian, and Institutionalist political economy are thus compatible with a classical-Keynesian approach.

ment process. Kaldor argued that,

> ...both the level and the rate of growth of output of the capitalist sector are dependent on the level, or rate of growth, of the effective demand for its products coining from outside the capitalist sector. The pace at which both output and employment can grow and at which industrial capital will accumulate will thus be dependent on the growth of exogenous demand. The capitalist sector, beyond a certain stage, cannot grow on its own, lifting itself by its own boot-straps. (Kaldor, 1977, p. 198)

In other words, economic growth is the result of demand, but in particular, the growth of the manufacturing (what Kaldor calls the "capitalist") sector will depend on sources of demand outside that sector. Since manufacturing holds a special place in the growth process as argued by Kaldor (1996), long run development will be dependent on the extent of demand for a particular nation's manufacturing output. This demand can come from other sectors in the domestic economy (a source which can be limited) or from exports. Additionally, the early stages of growth, particularly for late-comers, is characterized by imbalance between exports and imports which must be financed. The dependence on foreign capital implies that it will be difficult to grow in the face of capital flight, which was a permanent feature of the international economy during the period under consideration. Thus, the combined result of the foreign trade multiplier and the dependence on foreign capital is the so-called "balance of payments constraint" Thirlwall (1979). These themes feature prominently in all three papers.

The methodology of this dissertation is thus explicitly macroeconomic in the sense that structural relationships cannot be examined by reduction to individual or microlevel behavior. The examination of long run divergences in economies must thus consider those economies as wholes. This bears a similarity to the historical approach of the Annales school, in its

attempt to distinguish between *la longue durée* and *l'historie événementielle* Braudel (1980). The former is the history of the very long run which searches for coherence among and shared characteristics in structures, what Tilly (1984) called, "big structures, large processes and huge comparisons." The latter is the history of moments, the time of "the chronicle and the journalist." Braudel's three part series on civilization and capitalism thus distinguishes between the analytical levels of material life, economic life, and capitalism as a whole. The three levels of analysis stress the independent existence and causality of structures at different levels of aggregation. He compared the levels to the floors of a house. On the ground floor, we have material life – the history of the very short-run. The upper stories are thought of as consisting of economic life – the history of the machinery of exchange in the medium run. The final level, and the most abstract, is that of capitalism itself.

The present work imitates this separation of levels of analysis. We move from the most abstract, the question of long run development, to the intermediate level of medium run growth, to the description of a short-run cycle. In proceeding, the work is divided into four sections. In the following section (Chapter 2), I outline the basic theory of fundamental causes of growth as outlined by neoclassical authors. In this section, it is argued that they are untenable for historical and theoretical reasons. In Chapter 3, I offer estimates of import elasticities over the 19th century, suggesting that they are compatible with the notion that the balance of payments acts as a long run constraint on growth. Chapter 4 is a description of the Jacksonian cycle as sharing common characteristics with other cycles that result from financial dependency. A final chapter offers a brief conclusion.

CHAPTER 2

THE FISCAL STATE AND FUNDAMENTAL CAUSES OF GROWTH

Introduction

The recent revival of interest in long run economic growth has brought with it a rediscovery of economic history. Policy lessons for modern economies are increasingly justified by reference to the historical development of currently rich nations (Eichengreen, 2011). The historical approach has however been dominated by a singular vision, particularly with regard to questions of long run growth. Though the literature has separated itself into a threefold division of ultimate or "fundamental" determinants of growth (culture, geography, and institutions), all three share a vision of economic growth as a supply side process driven ultimately by a "liberal" state whose responsibility is the protection of private property rights. To this end, the "fundamental" growth theorists seek out historical explanations of more or less extractive states. In particular, the colonial "reversal of fortune" in which European colonies who were rich in the 16th century now find themselves poor and vice versa, has captured the attention of an expanding literature (Acemoglu, Johnson, & Robinson, 2002).

While growth theorists reassert the importance of the liberal state, recent developments among historians, sociologists, and political scientists

have begun to rethink its historical relevance. The Schumpetarian (1954) conception of the tax state as integral to industrialization has been revived by a rapidly growing literature on the European fiscal military state.[1] Additionally, a trend among development economists, led primarily by Chang (2002), has been to revise the histories of rich nations in light of their modern policy recommendations to the developing world. This has been accompanied by work on the "developmental state," a term used most recently to describe the East Asian experience (Woo-Cummings, 1999) but one that has roots in Latin American political economy as well (Caldentey, 2008). Finally, in the context of the U.S., rejecting the "liberal myth" in a variety of arenas has been increasingly popular.[2] Even in the early national period, the U.S. state apparatus can be seen as intimately involved in the growth process. The implication of this literature has been that consolidation of state power, and in particular fiscal power, is associated with long run growth. Thus, colonial divergence may be explained by the orientation of the state toward national development rather than its protection of property rights.

The two distinct trends attempt to characterize postcolonial political economy in the Americas in very different lights. Surprisingly, however, there is very little contact between them. Though perhaps the result of the insularity of disciplines, a central problem has been that while the fundamental causes literature rests on well established growth theory, the connections between the expansion of the fiscal state and growth have not always been explicit. The rise of endogenous growth theory has allowed a

[1] Brewer's (1990) book is a classic in this literature. See also Bonney's (1999) introduction to a collection of essays on the rise of the fiscal state in Europe.

[2] See for instance Edling (2003), John (1997) and Novak (2008). One could of course add that the liberal myth has been out of fashion among some groups of historians since the "commonwealth" studies of the 1940s.

clear connection between theory and the history of the liberal state, but the alternative literature on the fiscal state has in many ways avoided growth theory in favor of purely historical narratives.

While endogenous growth theory focuses on the supply of "factors of production" and savings decisions in particular (Cesaratto, 1999), an alternative tradition exists which emphasizes the autonomous components of demand (Commendatore, D'Acunto, Panico, & Pinto, 2003). Viewed from this perspective, the central problem of slow growth among former colonies has not been one of factor accumulation or productivity growth per se, but the slow growth of autonomous demand. In particular a central long run problem for the Latin American economies has been what McCombie and Thirlwall (1994) call the "balance of payments constraint." That is, external balance may require adjustment by way of income movements. The growth of domestic demand then is limited by the rate consistent with balance of payments equilibrium. Though a permanent feature of Latin American development, for the U.S., the balance of payments became increasingly irrelevant as a constraint on domestic growth over the course of the 19th century.

This chapter suggests that the concept of a fiscal state and its effect on the growth of demand is a more useful framework for understanding the historical evolution of postcolonial economies in the Americas than the fundamental causes literature. The fiscal powers of the state, interpreted as its tax capacity, monetary sovereignty, and debt relations, differ in degree among the former colonies as a result of the nature of their entry into world trade. The relative underdevelopment of fiscal powers of Latin American economies and the relative strength of the fiscal powers of the U.S. are the result of particular sets of economic interests established during their

respective colonial periods. The result has been a Latin American balance of payments experience in the 19th century characterized by a narrow focus on primary commodity exports and general financial dependency.

The chapter then proceeds as follows. The first section summarizes the literature on the fundamental causes of growth, emphasizing their relative agreement on the "proximate" character of growth. A second section suggests that the emphasis on the supply side of economic growth rests on shaky grounds both theoretically, as a result of the famous capital debates of the 1970s, and historically. A third section outlines the literature on the fiscal military state, with particular emphasis on the development of fiscal powers in the U.S. and the comparative lack of these powers among several Latin American states. A concluding section suggests that the fiscal powers and developmental orientation of the state are intimately related to the long run balance of payments experience.

The Fundamental Causes of Growth and Colonial Divergence

The literature on the fundamental causes can in some sense be thought of as an historical attempt to justify the modern policy prescriptions of property rights, contract enforcement, and independent, "technocratic" economic institutions. While the proximate causes of growth are generally taken to include the accumulation of factor supplies (most notably influenced by savings preferences) and the growth of productivity, the fundamental causes seek to explain the determinants of preferences and structures taken as exogenous in the proximate models. Interestingly, the notions of "fundamental" and "proximate" causes in relation to economic growth appear much earlier in Maddison (1988). He uses the terms in a

somewhat different sense than the mainstream authors we shall review. Maddison distinguishes between those factors that must be in place for growth to happen (ultimate causes) and those that govern the variation in growth. Acemoglu, Johnson, and Robinson (2005) and other mainstream authors seem to view the ultimate/fundamental causes as governing the long run pace of growth through the proximate causes. These fundamental causes are composed of three categories: geography, culture, and institutions (ibid.). A full treatment of this extensive literature is beyond the scope of the current paper, thus a brief summary noting the implication of these theories for colonial divergence follows.

Geography

The first set of fundamental factors concerns geography, understood as those natural resource endowments and climate conditions that affect the accumulation of factors and productivity directly, or indirectly through their effect on institutions. The most direct explanation is one that originates with Montesquieu's *The Spirit of Laws* (2011). Montesquieu argued that hotter climates would produce authoritarian political structures, and lazy and unproductive workers. The argument has been revived most recently by Dell, Jones, and Olken (2008). Collecting data on temperature and precipitation for a panel of 125 countries between 1950 and 2005, they suggest a variety of direct impacts of climate on growth. The most obvious is the agricultural output channel. But Dell et al. find industrial effects that they claim are mostly related to labor supply effects under higher temperatures. In addition they find an increase in political instability under higher temperatures which then reduces incentives to invest.

A second direct relation between geography and economic growth relates

to disease burden effects. Sachs (2001) has been particularly forceful in this literature. The burden of AIDS, malaria, and tuberculosis in particular are said to have severely limited the growth of labor supply. This hampers growth directly by slowing the growth of a factor of production, but also by creating a risky environment for investment Bloom and Sachs (1998).

Diamond (1997) argues for a more complex relation between geography and economic growth. For him, the timing of settled agriculture is determined by geographical differences. Settled agriculture in turn shaped the development of institutions, technologies, and resistance to disease. Eurasia thus has an early advantage with respect to agriculture and animals available for domestication from which everything else follows. The basis of the argument is the notion that the rise of a social surplus allowed the creation of nonproductive classes (and thus a greater division of labor) which in turn drives technological innovation.

Finally, a geographical institutional argument is at the center of work like Sokoloff and Engerman (2000) who argue that initial geographic endowments determine institutions through their effect on income distribution. Thus, initial resource conditions determine income and human capital distribution, which in turn determines political institutions. Institutions in turn influence the distribution of human capital and income distribution. Development then depends on both factor endowments and institutions, which can broadly be considered a function of endowments.

Engerman and Sokoloff focus their endowments explanation of institutions on the American colonies. They distinguish between three essential types of colonies: mineral, plantation, and settlement. In the mineral colonies, and plantation colonies, labor and land endowments are abundant, while in in the settlement colonies, only land is in abundance while

labor is scarce.

The conditions present in the northern English colonies then lent themselves to settlement. Harsh climate and land factors only allowed for smaller, family size farms. Growing seasons were shorter, the soil was poor, and the terrain was uneven, leading to subsistence farming. However, land was abundant, and small farming had low capital requirements, discouraging large concentrated land holdings.

In addition, in these colonies, European immigrants were the primary source of labor supply. Outside of the southern colonies, slave labor was not used extensively, and native populations were sparse. Thus, the North American colonies were somewhat more homogenous in terms of wealth distribution.

This is in sharp contrast to the Caribbean and South American colonies. Engerman and Sokoloff separate out these colonies into two types. One type had fertile lands that supported cash crops such as sugar. Crops grown in these colonies experienced greater economies of scale than those in North America. Thus, the development of large concentrated landholdings was common. In addition, this larger scale production supported the use of slave labor. Specialization in this kind of agricultural output led to the economies dominated by the production of cash crops. Even after abolition, inequality persisted for a long time due to a lack of political power among the lower classes. The second type of these colonies were established by the Spanish, and focused on mineral extraction and some agricultural production. Making use of native populations, the Spanish colonizers established an economic structure not unlike the first type of colony. Engerman and Sokoloff then argue that without such a large native population, the massive concentrations of wealth established in these

colonies would not have been possible. So we see that the Caribbean and South American colonies were characterized by inequality early on, and continued inequality through political exclusion.

Finally, Engerman and Sokoloff argue that the greater income equality, as well as the relative labor scarcity of the northern colonies, gave incentive to extend suffrage. Labor scarcity persisted even as the colonies gained independence. In addition, the scarcity of labor, particularly in new states joining the union, inspired the extension of suffrage to attract settlers.

The relationship between suffrage institutions and relatively equal income distribution and growth is not spelled out explicitly in Engerman and Sokoloff's work. The implication, however, is that democratic institutions will lead to greater protections of private property rights, and checks against expropriation by the state.

We may conclude by noting some potential objections to geographic determinants of long run growth. Industry features prominently in the development process as a result of its unique qualities (increasing returns to scale in particular), and while its character may have geographic elements, it is not clear that its presence would be geographically determined. In addition, the distribution of disease burden may just as well be the result of growth rather than its cause. Indeed, the Centers for Disease Control (which grew out of war-time malaria prevention programs) was able to virtually eliminate malaria in the U.S. South by 1952 (CDC, 2012). J. G. Williamson (2009) has also suggested that the inequality mechanism suggested by Engerman and Sokoloff may not be historically accurate. Instead, Williamson argues that Latin American inequality is not as persistent as assumed, and in fact, widespread inequality only began in the middle of the 19th century. Finally, we may note that it is not clear that

inequality has a univocal relation with growth (Barro, 2000).[3]

Culture

The cultural hypothesis finds its roots in Weber (2002), who begins his famous analysis of the rise of capitalism with the observation that, "business leaders and owners of capital, as well as the higher grades of skilled labour.... are overwhelmingly Protestant" (Weber, 2002, p. 35). In addition, he observes that even within Germany, the Protestant state tended to be more successful than the Catholic states. Weber then proceeds to argue that there is a particular affinity between the Protestant doctrine of predestination, and the "spirit" of capitalism itself.

What exactly connects the two? Weber argues that capitalism requires the internalization of certain values which were not necessarily natural, and were not held by noncapitalist groups (landed nobility and others). Capitalism requires the pursuit of profit, the rational (as opposed to traditional) organization of economic activity, and finally, the treatment of secular endeavors as a calling. The extent to which this "spirit" of capitalism was internalized would in some sense determine the success of a culture within the logic of the system.[4]

The Protestant ethic had a special relationship to the spirit of capitalism according to Weber. The doctrine of predestination, as the now familiar argument goes, led to the search for proof of election. Followers were chosen for election by God, but without a clear indication of who was saved. Earthly behavior then could be interpreted as some proof that one

[3]Theoretically, the ambiguous effects of distribution on growth have been emphasized by post-Keynesian models of growth. See for instance Marglin and Bhaduri (1990).

[4]Weber seems to argue that cultural concerns feature prominently in both the rise of capitalism, and certain groups success under its rule. Of course, the argument Weber lays out, as he continually reminds the reader, is incomplete and causation works in multiple directions.

had been saved. As Weber writes, "however useless good works might be as a means of attaining salvation... nevertheless, they are indispensable as a sign of election... In practice this means that God helps those who help themselves" (Weber, 2002, p. 115).

The obsessive concern with salvation had thus been turned toward secular works. Faith, in other words, was demonstrated by objective results. Weber then argues that this translates into economic behavior that is in accordance with the spirit of capitalism. The ascetic of Protestantism encouraged a "uniformity of life" and a discouragement of spending for pleasure. Hard work, thrift, and saving were the result and savings provided the source funds for investment and expansion of business (rather than wasteful consumption) for the glorification of God. The automaticity of the translation from savings to investment is provided by a religious motive. Of course, over time, Weber observes, the accumulation of wealth secularized this motive, but the Puritan formulation allowed the process to initiate.

More recently, the notion that culture has an initiating role in the development of capitalism has been revived. Perhaps the most prominent formulation is that of David Landes, who argues, "culture makes almost all the difference" Landes (2000).[5] In his lengthy treatment of the issue, Landes (1999) argues that a collection of Western values, rooted in the Judeo-Christian tradition, were responsible for the later economic success of Western Europe. The fragmentation that resulted from the separation of God and Caesar left the West open to freedom of thought and diversity of opinion. The consequence was innovation and rapid technological adoption. In addition, cultural traditions drove the adoption of property rights as well as the virtue of thrift.

[5]It is worth noting in passing that Landes seems to reject strict monocausal explanations in his earlier work.

The cultural hypothesis has notably been promoted by a variety of authors arguing variously that culture explains economic differences between East and West, racial groups, and major religions. The work collected in Harrison and Huntington (2000) seems to suggest that these cultural arguments are aimed directly at those who would explain economic differences through colonial past, imperialism, dependency, racism, geography, economic policy, and other noncultural explanations.

The cultural hypothesis has also expressed itself in the form of "social capital." The notion, developed popularly, emphasizes social contracts and trust networks. These networks help address risk of poverty (Narayan-Parker, 1998) and reduce the risk of taking advantage of new entrepreneurial opportunities (Isham & Kaufmann, 1999). Leonardi, Nanetti, and Putnam (1993) argue that empirical evidence suggests a positive relationship between social capital and growth. This particular formulation of the cultural hypothesis is presented with more difficulty than the Weberian variety, as the causal relationship between social capital and growth is not as clear in the context of established growth theory as that of savings preferences.

In the context of colonial experience, Véliz (1994) emphasizes the importance of cultures inherited from European empires. Thus, the promotion of Spanish Catholicism, a result of the Counter Reformation was central to long run development. Thus, Iberian heritage transferred to the South American colonies a set of cultural traditions that did not emphasize Protestant virtues and brought a large bureaucracy and a culture of centralization. The establishment of English colonies (100 years after Spanish colonies) was then associated with the Reformation and thus emphasized individual effort and a decentralized political system.

We may conclude our discussion by noting that several objections to the cultural hypothesis could be raised. Very clearly, measures of social capital may be the result of growth rather than its cause. Acemoglu et al. (2004) have suggested that though they shared the same history and cultural roots, North and South Korea experienced a significant divergence in growth rates after separation. More broadly, given the postwar development of Japan, and recent growth of China and India, it appears that capitalist growth is in fact quite flexible with respect to culture.

Institutions

The institutional argument has by far been the most popular. Its roots, within the mainstream, lie in the work of Coase (1937), who attempted to apply a marginalist framework to the explanation of firms and allocative efficiency in the presence of externalities. The introduction of transactions costs (the result of incomplete or asymmetric information) allowed Coase to conceptualize the firm as the emergent result of individual maximization. Institutions can then be succinctly described as, "the rules of the game of a society... humanly-devised constraints that structure interaction" (D. North, 1991, p. 5). That is, institutions reflect constraints on the rational maximizer's choice set, and thus allow the efficient allocation of resources in the presence of externalities, and reduce the transactions costs associated with exchange. The goal, in essence, is to explain the role of noneconomic factors in the context of methodological individualism. In describing the role of institutions in promoting growth in this section, I will focus on the literature of the New Institutionalists rather than other literature and conceptions of institutions, of which there are many.

The literature connecting institutions with growth is most commonly as-

sociated with Douglass North and more recently with Daron Acemoglu and his coauthors. The argument establishes a set of "good" institutions which then, through a variety of channels, should be associated with economic growth. More specifically, Acemoglu and Robinson (2001) have described a cluster of "institutions of private property," which are contrasted with "extractive" institutions.

It would be difficult to describe the full array of institutional setups and connections with growth as portrayed in the literature. However, a consistent theme seems to be the notion of incentives. As Acemoglu et al. (2005, p. 416) put it, "the institutions hypothesis links incentives to invest in physical and human capital and in technology to economic institutions, and argues that economic prosperity results from these investments." Interestingly, there is little else that is said by much of the modern empirical work on institutions on the question of causal mechanisms. The adoption of instrumental variable analysis has created a lot of empirical work that tries to narrow the quantitative effect but the underlying logic has perhaps not kept pace.

The argument is most succinctly put in D. North (1991). In his description of the role of institutions in growth, their role is to smooth the working of markets. Where kinship ties historically provided the information and enforcement of contracts required for markets to operate efficiently, North argues that institutions of private property took their place as the size of the market expanded. Importantly, North focuses on the issue of a capital market and the adoption of new technology, themes that reappear throughout work by institutional growth theorists. In places where rulers can arbitrarily seize assets (or even, North suggests, alter their value), capital markets will not develop. Thus, savings are not connected with

investment and capital accumulation does not take place. In addition, the adoption of the technology of manufacturing requires effective factor and product markets. Importantly, workers must be "disciplined" and free to contract as they please.[6] Thus, the argument suggests that the functioning of neoclassical markets requires institutions to deal with imperfect information and externalities. That is, long run growth differences are the result of the inability to appropriately deal with centuries old market imperfections.

The difficulty, however, lies in explaining differences in cross-country growth rates. If institutions constrain behavior so as to achieve optimal outcomes, then it is not clear why any group of individuals would devise suboptimal institutions. In particular, (R. Coase, 1960) argues that it is possible for agents to devise optimal institutions through the process of exchange. Consider Coase's (1959) famous example of radio stations. The problem was that radio frequencies of competing radio stations could potentially interfere with each other. Coase argued that external regulation was not necessary, regardless of the allocation of property rights, because it is possible for firms to pay each other to not interfere. Rights to broadcast would thus end up with those radio stations who had the higher potential economic gain. A large literature emerged suggesting that institutions are often efficient.[7]

The issue of efficient institutions was particularly problematic in North and Thomas' (1973) famous book, *The Rise of the Western World*. For if institutions were to be the drivers of long run growth, but institutions

[6]Thus, they have the property right to their own labor power in Marxian terms. Of course Marx would add that the freedom to contract was accompanied by a second, more sinister kind of freedom; the freeing of workers from their tools of production (Marx, 1976).

[7]See for instance O. Williamson (1993) or Demsetz (1967) among a host of others.

in turn were always efficient, long run convergence should be observed. Various ways of dealing with this problem have been devised. D. Romer (2003) has for instance created a model in which incomplete information about which institutions are most efficient creates a suboptimal outcome if the mistakes people make are correlated. In that sense, cultural argument may be reintroduced to the extent that shared (incorrect) beliefs are the result of cultural traditions. Alternatively, La Porta, Lopez-de Silanes, and Shleifer (2007) have argued that legal tradition leads to the creation of different institutions; thus, civil law countries will have worse institutions than common law countries. The legal institutions themselves are externally generated by European colonialism in the argument made by La Porta et al. (2007).

Finally, perhaps the most theoretically satisfactory solution to the problem has been what Acemoglu et al. (2005) call the "social conflict" view. This approach comes close to a methodological individualist version of Marxism, where political elites are self-interested and may enforce institutions that benefit them but not society. Even in the presence of full information, then, society can end up with suboptimal (extractive) institutions as a result of the capture of the state by self-interested elites. Greater inequality may then be associated with worse institutions to the extent it reflects the capture of the state by a small group of elites. Implicit in this notion is a concept of path dependence in which the initial institutions created by elites persist over time, reinforcing the concentration of power.

The issue of whether democratic political institutions and growth are related has, however, been problematic for this tradition. Democracies clearly do not have a monopoly on the protection of property rights; autocratic regimes may certainly protect certain kinds of property rights as

well. In addition, democracy may be associated with redistribution that is in some ways inefficient. Finally, Acemoglu and Robinson (2012) argue that democracies, due to more equal distributions of political power, are better able to provide a "level playing field" which allows the process of creative destruction to operate.[8]

Acemoglu and Robinson (2001) make a similar argument to Engerman and Sokoloff's story about colonial divergence but with slightly different causation. That is, they emphasize the disease environment and its effects on settler mortality rather than initial endowments of people and resources. High mortality rates lead to low settlement and extractive institutions. Thus, mortality rates determined the colonial strategy in place. Much like in Engerman and Sokoloff, colonies can take an extractive or settlement form. The key difference between the two views is that Engerman and Sokoloff assume the persistence of labor scarcity in North America, and the persistence of inequality and labor abundance in South America. While both argue for the persistence of institutions, then, the Engerman and Sokoloff view seems to emphasize the persistence of geographical concerns as well. For Acemoglu et al., institutions play a much more fundamental role, even after mortality rates declined.

The implication of these histories has been recommendations that emphasize independent policy-making institutions. If the main problem of the less developed countries is the extractive nature of their elites, limiting their influence over economic policy should be paramount. Thus,

[8] An example of the potential conflict between "good" institutions and democracy in mainstream literature that is generally not mentioned by growth theorists is that of central banks. Consider Eichengreen's (1992) suggestion that the gold standard system relied on the credibility of the commitment of central banks. This credibility in turn is dependent on the absence of competing policy goals (like the pursuit of full employment domestically). Broad access to the political process undermines the stability of the system. This theme is equally present in modern discussions of central bank "independence" (Walsh, 2008).

central banks, currency boards, and even fiscal policies should be run by technocrats or international institutions who exhibit more responsibility.[9] Notably, even these limits may not be enough. Eichengreen (1992) has argued that the collapse of the gold standard was in fact the result of the rise of working classes and the loss of policy credibility among participating nations. The troubled experience of peripheral nations even at the height of the gold standard can then be attributed to their lack of cooperation and credibility.

The central concern has thus been containing the predatory nature of the state. In this sense, all the fundamental causes that emphasize, in the end, a liberal state are in line with North's (1981) view of economic development. In his view, economic development is the result of efficient property rights structures, enforced by the state, which has, however, conflicting motives to maximize its own wealth. In this sense, North saw the U.S. in the 19th century as a golden age in which severe restraints were placed on the extractive powers of the state.

The fundamental causes literature has then been focused essentially on the accumulation of factors, and productivity. To the extent that geography, culture, or institutions encourage the growth of factor supplies - mainly capital - through the reward to saving or the growth of productivity by protecting the intellectual property rights of invention, they can be considered fundamental determinants of a supply side growth process. Additionally, a major theme of the literature has been the notion that a light state (whether the result of geographic endowment, culture, or institutional processes) is the reason behind the success of the developed countries. The state should then protect property rights and underwrite

[9]Witness the popularity of "independent" central banks, or the fiscal policy limits imposed by the Maastricht treaty.

markets, but do little else.

Supply Side Visions

The focus of the literature on long run growth on supply side factors is unsurprising given its roots in the theory of endogenous growth. An important consequence of the theoretical shift in growth theory in the 1970s and 1980s is that it restored the role of savings in economic growth (Cesaratto, 1999). Where it had been just a matter of levels in Solowian models of growth, savings could now affect the long run steady state rate of growth.[10] Without attempting to summarize this substantial literature, it may be said that it is an attempt to "endogenize" the steady state by allowing technical change to be determined from within the model.[11] The consequences of endogenizing growth in this way is a return of savings to the driver's seat of growth.[12] In addition, because endogenizing technical change involves introducing market imperfections (spillovers, increasing returns, etc.), the savings rate chosen by agents in the model may in fact be suboptimal. Thus, the role for policy can be reintroduced, in some sense inspiring the contributions to "fundamental" causes of growth described above.

In these models of growth, aggregated demand is usually assumed to passively adjust to a long-term supply side limit. In particular, in most models, the accumulation of capital is assumed to adjust to planned saving. This process, at the heart of modern versions of Say's law, implies

[10]It is perhaps no coincidence that the 1970s and 1980s also represented the era of the "revenge of the rentier" (L. L. Pasinetti, 1997).

[11]See P. Romer (1994). Some seminal papers include Uzawa (1965), Arrow (1962), and M. Frankel (1962)

[12]It may be noted that human capital and technical progress in many models are the result of a different kind of savings decision - one of time - but the point remains.

that consumption must be sacrificed for accumulation to take place. This in turn is the result of assuming an investment demand function that is elastic with respect to the rate of interest Garegnani (1979). In the case where higher income groups save more than lower income groups, this implied that inequality was a prerequisite for growth.[13] More recently, mainstream growth theory has been somewhat kinder to the laboring classes, arguing that there may be some externalities that imply that there are limits to inequality's encouragement of growth (Alesina & Perotti, 1996). The essential mechanism remains, however, and the notion that consumption must be sacrificed for accumulation is at the heart of modern growth theory.

A central problem facing any theory of growth in which savings drives investment is the well-known result of the Cambridge capital debates. This is that the demand for capital, understood as a produced means of production, cannot be said to be univocally related to its price. The potential of reswitiching and reverse capital deepening imply that we cannot rely on factor substitution as a key determinant of either distribution or growth. As Garegnani (2000) points out,

> the roots of reverse capital deepening, as well as of the re-switching of techniques, lie in the effect of changes in distribution (rate of profits) upon the relative prices of the alternative sorts of capital goods required in the processes of production that are being compared. (Garegnani, 2000, p. 433)

The more "capital intensive" techniques of production may in fact be chosen at a *higher* rate of interest. This is because, as pointed out in Gareg-

[13] See for instance R. Nelson (1956). Of course the view that inequality may be a prerequisite for growth is shared by a host of traditions in economic thought. A full review would be beyond the scope of this paper. It is, however, worth noting that to the extent that countries who develop later would have higher initial fixed costs to industrialization as technology progresses. If we assume that savings is the source of investment, this implies that countries who develop late must have even greater levels of inequality than those who developed earlier.

nani's quote above, distributional changes can alter the price of capital.

A rehashing of the results of the capital debates is not necessary and a host of summaries are available.[14] For our purposes, there are two important results. First, the rate of interest cannot be seen as an equilibrating mechanism bringing savings and investment in line. Indeed, the rate of interest cannot be determined in the market for loanable funds at all. Second, there is no guarantee that the operation of supply and demand will bring resources into full employment. Thus, the consequences for Solowian growth theory and endogenous growth theory alike are devastating. The supply of savings cannot govern the long run rate of growth as in endogenous growth theory or approaches to a steady state as in Solow. In addition, the possibility that markets will not bring about full employment of factors suggests that one cannot ignore the possibility of demand-determined unemployment equilibrium, even in the long run (Eatwell, 1983).[15]

In addition to the theoretical problems with interest elastic capital accumulation, there are empirical problems as well. A host of empirical work on investment has found that it does not seem to be sensitive to the cost of capital. Chirinko (1993) in a summary of the literature finds that, "output (or sales) is clearly the dominant determinant of investment with the user cost having a modest effect." Thus, it is empirically difficult to justify the

[14] See for instance Harcourt (1972) or L. Pasinetti and Scazzieri (1990)

[15] We may note another consequence for the theory of fundamental growth. The capital critiques, though brushed off by many, did indeed produce a change in the neoclassical theory of markets. As Garegnani (1976) and Milgate (1979) point out, the result was a "change in the notion of equilibrium." Faced with the inability to describe capital as a single quantity, mainstream theory moved toward the Walrasian conception of markets. General equilibrium implies that each capital good has its own rate of return, thus avoiding the complications of associating a capital aggregate with the rate of profits. Of course, the cost of the movement toward general equilibrium and intertemporal models is that one can no longer speak of a uniform rate of profit. The uniform rate of profit across sectors captures the classical notion of competition, and without it, these models lose a good deal of relevance, as Garegnani (1976) points out.

notion that capital accumulation is driven by savings, and seems much more likely that investment is the result of demand.[16]

It is, even in long run periods of rapid change, difficult to justify the notion that the scarcity of savings governed the pace of capital accumulation. It seems to be the case that the financial system is able, in periods of rising demand and technological change such as the industrial revolution, to support increases in investment. On this point, it is worth quoting Braudel at length:

> I cannot avoid the impression that, even in the eighteenth century and if anything more so then, the money accumulated far exceeded the demand for capital; that England for instance certainly did not summon up all her reserves to finance her industrial revolution, and that much more effort and investment might have been forthcoming than actually appeared...which explains why... the coal mines in the eighteenth century were able, without undue delay or difficulty, to find the fixed and circulating capital necessary to work them, when the occasion demanded it. (Braudel 1982, p. 398-9).

We see, then, that capital accumulation is likely the result of growth in demand, rather than supply side conditions, particularly the level of the rate of interest.

Labor as a productive factor that is exogenous to demand may also be a problem because, as Kaldor (1966) and Lewis (1954) point out, surplus labor is often concealed in the agricultural sector, to be drawn out as manufacturing and services demand. Agriculture, it is said, absorbs surplus labor and thus labor is elastic to demand. In addition, patterns of immigration will also be such as to respond to economic activity in the "modern" sector (Cornwall & Cornwall, 2001). The flexibility of labor-force participa-

[16] It may be noted that in the short-run, the rate of interest may indeed be negatively associated with spending to the extent it affects residential and consumer durables spending. This does not, however, imply that increases in savings cause higher levels of investment through interest rate adjustments.

tion and the presence of international migration suggest that labor supply should be considered endogenous to GDP growth. While the economic historian sees the immigration and internal migration of labor as the response of factor flows to relative scarcities, we shall view it through the lens of demand led growth.

Historical evidence of the endogeneity of labor supply is readily available. For instance, in the U.S., waves of immigration in the 1840s and 1880s were clearly associated with domestic economic activity. As Margo (2000) argues, "During phases of the American business cycle, immigration to the United States surged," which in turn affected the 19th century labor force.[17]

Changes in labor force participation were also clearly timed with the expansion of industry. Goldin and Sokoloff (1984) have argued that the importance of women and children in industrialization in the Northeast stems from their low productivity on the farm. This could be interpreted as a form of "disguised unemployment." The result of this was that over the 19th century, the labor force grew faster than the population (Margo, 2000). This suggests that natural increase was no limit on the growth of industry.

Finally, we may suggest that even productivity responds to the level of demand in the economy. Kaldor (1966), building on Young (1928) and Verdoorn (1993), suggested that the growth of productivity itself was endogenous to economic growth. Of course, this is a principle that can be found in some of the endogenous growth theory described earlier. Since Smith (1776), however, it has been known that economic growth inspires

[17]Margo does, however, argue earlier in the chapter that, "increases in the supply of labor account for the largest fraction of aggregate growth in the nineteenth century..." It is difficult to reconcile this view with the view that labor supplies responded to the business cycle.

invention.[18] To the extent that the growth of the economy pushes against its capacity limit, technological changes occur more rapidly. Thus, as Kaldor points out, we do not find ourselves in Ricardo's world where the growth of population limits manufacturing growth as more and more labor and capital are devoted to food production. Instead, a relatively small proportion of resources are dedicated to food production with a much larger population.

The concept of endogenous productivity growth emerged in economic history in the 1960s as well. The concept of "learning by doing" suggests that manufacturing productivity increases may be endogenous to the growth of manufacturing output.[19] Davis and Stettler (1966) have argued that this principle explains the productivity growth in antebellum textile manufacturing, long after new capital had been installed. Of course, the notion of "learning by doing" makes a great deal of sense to the extent that technology is embodied in physical capital goods.[20] We might also recall David Landes' (1969) suggestion that many of the inventions of the industrial revolution were in fact motivated by necessity. Thus, he writes, "the demand for coal pushed mines deeper until water seepage became a serious hazard; the answer was the creation of a more efficient pump, the

[18]Smith (1776) argues that the division of labor, which in turn is limited by the extent of the market, inspires innovation. A similar story seems to be the case for the U.S. during the 19th century. As Nelson and Wright (1992) note, "relatively little of the American performance during this era was based in science, nor even on advanced technical education. American technology was practical, shop-floor oriented, built on experience."

[19]The seminal references here are Arrow (1962) and David (1973, 1985). Thus, the Kaldor-Verdoorn law has some overlap with some of the work in endogenous growth theory, as noted. However, in many of the endogenous growth models, productivity growth or inventions are the result of the amount of resources devoted to human capital or R&D. In this sense, supply driven productivity growth has been reintroduced.

[20]It is worth noting the the rediscovery of "learning by doing" and other mechanisms by which growth causes productivity changes occurred in the 1960s. This is just a decade before the productivity growth slowdown of the 1970s which seemed to puzzle many economists. It is strange that this productivity slowdown was not readily understood as a result of the slowdown of growth!

atmospheric steam engine." Landes' book also emphasizes the inherent backward and forward linkages in the process of innovation that are the result of attempts to meet rising demands.

It would appear, then, that there is substantial historical evidence that suggests factor supplies and their productivity are responsive to the growth of output itself. This is suggestive of the relevance of effective demand even in the long run. Following Kaldor (1970), we may argue that expansions of autonomous demand increase capacity utilization in the short-run, but can increase the amount of capacity itself in the long run. In this sense, investment is a category of induced expenditure via the accelerator mechanism. Kaldor emphasized that, "investment decisions must themselves be governed by changes in the level of production" (Kaldor, 1996, p. 35). In addition, he suggests that we must, "consider the effects of investment on productive capacity" (Kaldor 1996, p. 34). Thus, for Kaldor, investment is a derived demand, and creates additional capacity.

A key insight of the Kaldorian growth models is that if countries are unable to finance ever increasing deficits, economic growth may be constrained by the growth of exports. Of course, it is not theoretically possible that all countries are balance of payments constrained. In particular, countries whose currencies play a large role in international trade and finance may find themselves able to attract foreign funds indefinitely. Thus, the British empire finds itself with a trade deficit for better part of the 19th century. Similarly, the U.S. has run substantial trade deficits since the 1980s. The development of financial dominance encouraged by the state then has the potential to lift a major demand constraint.

The Myth of the Liberal State

In addition to the problems with supply side view of growth, it may be objected that the Anglo-American liberal state assumed by North, Acemoglu, Engerman and Sokoloff, and others simply did not exist. Certainly, it has been argued by a number historians and development economists that late comers to industrialization have required strong participation by the state.[21] However, it should be noted that even among the currently industrialized countries, the state had significant presence. Chang (2002) has been particularly forceful in revising the historical political economy of the currently industrialized countries. Chang has focused on technological policies, trade policies, and other protectionist measures. Even Chang, however, suggests that the main role of the state in U.S. development has primarily been limited to the building of tariff walls.

The idea of the predatory or extractive state that must be defended against has a long tradition in U.S. rhetoric. As Novak (2008) argues, the U.S. past is often recounted in a framework of powerlessness and constitutional restraint or as a constant struggle for political liberty. This has created in some sense a cognitive dissonance where historical rhetoric and political reality find themselves at odds.[22] In this section, we suggest that it is not clear that the U.S. state in the 19th century possessed the qualities of the liberal state as argued by the fundamental causes authors. In

[21] See for instance Gerschenkron (1962), Amsden (2003), and Chang (2002).

[22] Novak (2008) tells the story of Senator Ernest "Fritz" Hollings (D-SC), who sought the 1984 Democratic nomination for president. Hollings in his stump speeches told a story about, "a guy who came home from the Korean War, went to college on a form of the GI Bill, opened a business with a Small Business Administration loan, made sure his parents' farm was adequately wired through Rural Electrification and irrigated with assistance from the Army Corps of Engineers, saw his kids get subsidized school lunches at a school that received lab equipment from a National Science Foundation grant, got his mortgage from the FHA and hurricane disaster relief from FEMA, and one day, took AMTRAK to Washington to complain to his congressman about getting big government off people's backs" (Novak, 2008, p. 753).

particular, the fiscal powers of the state were established early on, with long-term effects for development.

Perhaps the greatest emphasis in the literature on long run growth has been on the protection of property rights. In this sense, the Anglo-American model of development has been argued to consist of strong protections against property theft either by the state or by other citizens D. C. North (1981). The historical record of property rights protection in the U.S. is not as clear as is usually presented. In fact, what emerges is a rather complex picture that suggests property rights are best thought of as social relations, rather than relations between people and things (G. Friedman, 2001). Indeed, it seems that property rights and their allocation have been continually revised so as to be, in Justice Frank Murphy's description, "as broad as the economic needs of the nation."[23]

Until the 19th century, the U.S. did not respect international property rights. The U.S. Copyright Act of 1790 only protected U.S. citizens. Indeed, Henn (1953, p. 43) argues, "For over a hundred years, this nation not only denied copyright protection to published works by foreigners, applying the 'nationality-of-the-author' principle, but appeared to encourage the piracy of such works."[24] Of course the well-known histories of Samuel Slater and Francis Cabot Lowell and their study of British manufacturing technology are a testament to this. The U.S. did not actively promote international intellectual property rights until after World War II (Ringer, 1968) in order to protect its now dominant status as manufacturer to the world, an example of what Chang (2002) calls "kicking away the ladder." Even

[23]Justice Frank Murphy wrote the majority decision in American Power and Light Co. v. Securities and Exchange Commission 329 U. S. 90 (1946).

[24]The works of Charles Dickens were particularly popular for unauthorized reproduction in the U.S. - a fact that greatly angered Dickens who toured the U.S. in 1842 pleading for stronger intellectual copyright protections.

domestic patent laws throughout the 19th century could be considered highly deficient by modern standards. In particular, no proof of originality was required prior to the 1836 overhaul of patent legislation.

More generally, federal, state, or local governments often redefined, reallocated, or otherwise adjusted property rights to meet various need. For instance both Lamoreaux (2011) and G. Friedman (2001) cite the *Charles River Bridge* case as an early example of the redefinition of property rights to meet social goals. The Massachusetts General Court in 1785 granted a charter of incorporation to investors wishing to build a bridge across the Charles River. The investors were guaranteed exclusive rights to collect tolls for 40 years. However, once the bridge was constructed, a competitor was granted the right to construct a bridge alongside the original bridge in 1828. The original investors protested that the charter for the second bridge was a clear violation and threat to the security of property rights. Chief Justice Roger Taney, in his ruling on the case, suggested that protecting the property rights of the original company would have in fact interfered with ongoing transportation projects.

The redefinition and reallocation of property rights was ongoing throughout the 19th century.[25] As Lamoreaux (2011) notes, "sometimes these reallocations favored politically powerful interests; sometimes they occurred at the behest of a majority of the voting public. Regardless, in only some cases did the original holders receive adequate compensation" (p. 283). In the majority of cases, the reallocation of property rights does not seem to have interfered with activity in the affected sector, which continued as long as there was effective demand forthcoming.[26] In general, however, a de-

[25]The emancipation of slaves can in this context be seen as perhaps the largest violation of property rights in U.S. history. Over half of Southern wealth was in the form of slaves on the eve of the Civil War (Atack & Passell, 1994).

[26]Both Lamoreaux (2011) and Friedman (2001) seem to agree on this point, though Lam-

tailed examination of the history of specific legislation reveals a quite complex picture of the practice of property rights enforcement by the courts as well as federal, state, and local governments. [27]

More importantly, the innovation that is supposed to be so closely tied to the respect of property rights often did not spring from the imagination of the entrepreneur, but was explicitly funded and promoted by the state. Early U.S. technological development was, as is well known, marked by the use of interchangeable parts. The use of interchangeable parts was central to what came to be called, the "American system" of manufactures which then enabled the later introduction of the assembly line and mass production (Hounshell, 1985). Often attributed to Eli Whitney, the use of interchangeable parts is much more appropriately traced back to the Harper's Ferry Armory (Woodbury, 1960). In addition, the Springfield Armory became the central organizing agency of a network of arms producers. In doing so, the Armory became the center, not only of technological innovation, but of dissemination of information, instructing local arms producers in best practices and management techniques (Tull, 2001). The result was, in Best's (1990) words, "inadvertent industrial policy" in the service of the military needs of the state.[28] Thus, the military demands of the state led industrial innovation. In addition, Lively (1955) has emphasized the role of the elected public official in the development of the American system,

---

oreaux emphasizes the democracy of ownership (paradoxically) as the reason why reallocation of property rights did not threaten potential investors.

[27] Modern property rights have been argued to be associated with high growth. The cross country regressions that these claims rely on, however, are somewhat problematic. See for instance King et al. (2010). Likewise, Chang (2007) has accused the property rights literature of being far too simplistic in its definition of property rights and their assumed effects. The historian of property rights will of course be sympathetic to this notion.

[28] The notion of "inadvertent industrial policy" seems to be a U.S. tradition. Block and Keller (2011) outline what they call the "invisible hand of government." A great deal of technological development throughout U.S. history has been a "military enterprise" (De Medeiros, 2003).

who, “replaced the individual enterpriser as the key figure in the release of capitalist energy; the public treasury, rather than private saving, became the major source of venture capital.”

The State and Fiscal Strength

In addition, the historically more successful nations seem to be associated with growing fiscal powers and more centralized bureaucracy. Indeed, O’brien (2007) dubs the histories of Europe as told by Douglass North and others, “liberal narratives.” Thus, he claims, “something approximating to a Washington Consensus has… dominated the writing of British economic history” (O’brien, 2007, p. 180). In this vision, the Glorious Revolution is seen as a democratic and rational triumph that set the institutional framework for later British dominance. A longer view of history, however, suggests that the dominance of states had much more to do with the role of their financial sector, fiscal powers, and the empire building these allowed. That is, the success of nations can only be understood in the context of strong states in world that is essentially conflictual. Along the way, distributive conflict was resolved, but more often than not, it was resolved in favor of elites. Indeed, the successive rise of European centers of power, from the Italian city states in the Renaissance to the Dutch Republics to eventual British dominance, seem more closely associated with financial and military dominance as opposed to equality or democracy. The rise of the public debt that allowed the state to finance nation building was thus associated not with equality of property and democratic reform, but of the alignment of financial elites and state governments.

Braudel has noted that in early modern European history, “The state was a looming presence, the coming together of many things” (Braudel,

1984, p. 514). That is, the state is a structural concept that reflects the unity of a variety of things from the development of bureaucrats to conflicts among social classes. He goes on to argue that, "When it appeared at any rate, the modern state distorted or shattered all previous formations and institutions" (Braudel, 1984, p. 515). Polanyi (1957) agrees, suggesting that while markets were present before the arrival of capitalism, they were primarily external. Thus, "internal trade in in Western Europe was actually created by the intervention of the state." The conclusions of these historians would then suggest that the state has played a much larger role than as a simple protector of private property rights. Indeed, it was the state's intervention that broke down local barriers to construct an internal market in the first place.

In addition, British development, as has been pointed out by Chang (2002) among others, happened behind significant trade protections and industrial policy. The development of industry with the encouragement of the state seems to be the general rule. Reinert and Reinert (2005) note in their review of mercantilism that, "production-focused mercantilist policies have been a mandatory passage point for nations that have taken the step from poor to wealthy, from England starting in 1485 to South Korea in the 1980s" (Reinert & Reinert, 2005).

The internal functions of the state were, at least in early modern Europe, however, motivated by external competition. As Brewer (1990) argues, a large and well-organized military was essential to the maintenance of British commercial superiority, which could only be possible with the creation of a "fiscal-military" state. Military dominance was achieved in part through a large and effective bureaucracy that could mobilize resources.[29]

[29]There is thus some truth to Charles Tilly's observation that, "war made the state, and the state made war" (Tilly & Ardant, 1975, p. 42). Of course, there are also linkages

For the United States, the debate over ratification of the constitution has been placed in a fiscal-military state context in recent scholarship that makes use of the publication of *The Documentary History of the Ratification of the Constitution.* Edling (2003) has argued strongly for a reinterpretation of the debate along state formation lines. Textual analysis of the publications of less well known Federalists and Anti-Federalists has revealed something of a more complicated picture than is usually recounted. Thus, Edling argues, "To an understanding of the issues debated in the ratification struggle, however, the functional aspects of the state, that is, what the state *does*, is much more relevant" (Edling, 2003, p. 45). The state's extractive capacity, military ability, and centralization of authority were all at the heart of the debate. John (2006) has similarly argued that themes of governmental agency, the effect of federalism on 19th century political economy, and the influence of the state on civic ideals have dominated the recent historical literature. Ratification, then, was an attempt to construct a uniquely American version of the European fiscal-military state, reflecting what W.A. Williams called an early "pattern of empire thought."

This played out in the early establishment of the tax powers of the new federal government under the Constitution. The pattern of changes in tax revenue seems to a great extent linked to war, much as in the European case (Bensel, 1990). State revenue increased after wars, but its structure changed as well. In U.S. tax history over the 19th century, the structure and size of taxation can readily be split into two periods on either side of the Civil War. In that sense, there was perhaps less of an influence of external conflict in the U.S. case, but nonetheless, war seems to be the primary catalyst. The fiscal-military state, envisioned by Hamilton and the

---

between the state building project and distributional conflict as emphasized by Poggi (1978).

Federalists, and modeled after 18th-century England, thus only came to fruition after the Civil War.

The antebellum period is primarily characterized by a heavy reliance on tariffs at the federal level. As has been repeatedly pointed out by Bairoch (1995), the U.S. was the "mother country" of infant industry promotion. Over the 19th century, Chang (2002) points out that the U.S. maintained higher average tariff rates than any other country in the world. Indeed, Bairoch (1995) has argued that there were three distinct eras in U.S. trade policy during the 19th century. The years 1816 to 1846 Bairoch calls the "protectionist phase," 1846 to 1861 is dubbed an era of "modest protectionism," and finally, 1861 to 1914 a period of "strict protectionism."

There has been considerable debate on the effects of these tariffs. In the antebellum period, Taussig (1931) argued that the textile industry had been initially protected by tariffs but no longer needed the tariff by the early 1830s. Harley (1992) has estimated, however, that tariff removal would have caused the share of domestic production in domestic consumption to shrink to 10% as late as the 1850s. Irwin and Temin (2001) have countered that simple cost comparison is inappropriate given the different quality of the goods. They then estimate the responsiveness of industry to changes in import prices and concur with Taussig that the industry was independent by the 1830s. Bils (1984) has argued strongly against this view claiming, through an estimation of a cost-quality function between the U.S. and Britain, that the textile industry would have been wiped out without tariff protection, even in the 1830s.

In the latter quarter of the century, the story is a bit clearer. Both O'Rourke (2000) and Clemens and Williamson (2001) have found evidence for a relationship between tariffs and growth rates and industrialization.

Irwin (2000) has suggested that for one infant industry at this time, the tinplate industry, tariffs promoted its early development.

It seems, then, that import substitution through tariff policy was likely one cause of a decline income elasticity of imports. Tariffs, however, also play another important role. As Irwin (2004) has pointed out, Hamilton's tariff promotion was not exclusively for the encouragement of manufactures. Indeed, Hamilton's 1789 tariff proposal was designed to also provide for the support of the federal government and to discharge the debts of the U.S.[30] The U.S. government was heavily dependent on the tariff as the Constitution limited congress ability to raise revenue elsewhere (Atack & Passell, 1994). Aside from tariffs, Congress could enact excise taxes and sell public lands. Thus, tariffs accounted for at least 80% of federal revenue during the antebellum period.

Perhaps even more important than tariffs was the role of the federal government in establishing financial markets and a national currency. Sylla (1999) compares the establishment of Hamilton's plan for government finance to the financial revolution in England during the 18th century. The conversion of revolutionary debts to long-term federal securities, the establishment of a national bank, and the determination of the money of account allowed the rapid development of securities markets in Philadelphia, New York, and Boston. Public debt provided a relatively safe asset to trade, as did stock in the Bank of the United States (the public securities were in fact receivable in Bank of the United States stock) (Sylla, 1999).

It was the Civil War that fundamentally changed the fiscal foundations of the state. Indeed, public finance was to shape U.S. financial markets throughout the second half of the century, as the Civil War provided a

[30] It may of course be the case that a kind of Laffer curve in tariffs exists. Thus, the more protectionist tariffs are, the less revenue they raise.

strong impetus to the policies that created the national banking system and a truly national currency. That is, the financial needs of war generated national banking policy which reflected the "political project to wrest control over money from subnation authorities to the center" (McNamara, 2003).

In addition, it involved a massive expansion of debt and a widening of the tax revenue base. This increase in debt issues provided a deepening relation between private financiers and the national interest, as pointed out by Hamilton years before. The Civil War, then, represents a massive shift in the tax and debt structure of the U.S.[31]

The effect of a well funded public debt (managed, at least initially, by the Bank of the United States) was twofold. On the one hand, as already noted, it led to the rapid development of financial markets in the U.S. To the extent that industrial development requires an elastic supply of credit money, the development of the U.S. over the course of the 19th century could in some sense be considered "finance-led," with finance in turn being driven by public credit.[32] Secondly, the expansion of public debt had a large impact on the creditworthiness of U.S. securities in foreign markets. Far from worsening creditworthiness, the expansion of a well funded debt actually increased the depth of financial markets and the willingness of foreign capital to participate.

In addition to establishing national debt and securities markets, the federal government actively promoted the triumph of a national currency. In the U.S., the 19th century could be characterized by a slow, sometimes halting process in which the federal government gained control over na-

[31] Pollack (2009) discusses the role of war in expanding the fiscal state during the 19th century.

[32] Levine (2005)discusses a good deal of the literature on finance and growth. Rousseau and Sylla (2005) have made the argument for finance-led growth in the 19th century.

tional currency. Battling internal exchange rates due to various metals circulating as coin, removing foreign currency from circulation, limiting and standardizing the expansion of private banknotes, and providing small denomination currency for the working class were at various times direct or indirect goals of public policy (Helleiner, 1999). In this sense, the Civil War, with its massive fiscal requirements, represented a watershed moment. Financing the war produced a series of legislative acts with the goal of establishing a national banking system with a national note, which was backed by federal bonds. However, national banking acts were not the sole cause of the watershed. The massive asset emissions during the Civil War produced a common and portable means of settlement, and thus consolidated the payments system, even before the national banking acts were passed (Weiman & James, 2007). Thus, the fiscal-military state produced strong and deliberate policy directed at creating a national currency system.

A similar process was at work during the European era of state building. Far from the natural outcome of markets, they were instead the result of "painstaking and deliberate activities of public authorities" (Zelizer, 1994, p. 205). Cohen (1998) suggests that the advantage of establishing territorial currencies to the state building project was four-fold. Territorial currencies promoted national unity (as a symbol), contributed to public revenue, allowed macroeconomic stabilization policy, and protected states from foreign coercion.

Prior to the establishment of these currencies, which was a long and unsteady process, private monies freely moved across national borders without issue (Rochon & Vernengo, 2003). Goodhart (1998) notes that establishing monetary sovereignty in which the state's money is at the top

of the hierarchy of money implies a relation between the powers of fiscal policy and money creation. This relation runs both ways. As already mentioned, monetary sovereignty implies the ability to engage in fiscal stabilization policy. However, equally important, a substantial tax structure must be in place before a nation can hope to establish national money as the unit of account. Even then, the process can take time and requires removal of foreign currencies, the standardization of paper notes, the creation of domestic financial institutions, and a host of other active policies (Helleiner, 1999).

A degree of instability can thus result from internal as well as external exchange rates. Cross border currency competition has been a feature of economic life for most of modern history. States that were able to slowly take control of currency and establish national monies found themselves able to build domestic markets, and to establish dominance internationally through the control of trade routes, and financial expansion that forced other territorial currencies into submission. Thus, Kirshner (1997, p. 29) argues, "monetary power is a remarkably efficient component of state power... the most potent instrument of economic coercion available to states in a position to exercise it."

Conclusion

The consequences of the expansion of US fiscal powers would be difficult to overstate. It was, in fact, central to overcoming one of the major forces behind the balance of payments constraint, namely the denomination of external debt. Indeed, the federal government escaped original sin very early on with its external debt denominated primarily in dollars by the beginning of the 19th century (Bordo, Meissner, & Redish, 2003). Of course

at various times, the U.S. government's promise to pay was explicitly or implicitly fixed in gold. State debts did, however, tend to be denominated in sterling prior to 1840, and occasionally thereafter as Wilkins (2004) notes. Wilkins also finds that private companies issued debt in foreign markets in sterling until late in the century. On the whole however, Bordo et al. argue that, "since the 1850s, all players in the economy were able to issue debt denominated in U.S. dollars... that nonresidents were willing to hold." Thus, though it may not have achieved key currency status until the interwar period, the financial dependence that characterized early U.S. growth was significantly decreased, though not eliminated, by the end of the century. It was WWI that transformed the U.S. into a creditor in international capital markets, but the institutional framework laid by Hamilton and the federalists set the stage.

The developmental role of the state evolved along very different lines in Latin America, however. Furtado (1968) argues that this difference was reflected in the economic policies advocated by Alexander Hamilton and the Viscount of Cairú, José da Silva Lisboa, claiming each were representative of the ruling classes.[33] Hamilton lobbied for industrial policy while Cairú pursued free trade, reflecting the export interests of large-scale farmers. To this story, Vernengo (2006) adds the role of public finance, as Cairú made no attempts at establishing national credit. The absence of a strong fiscal state was not for lack of military conflict. As Centeno (1997) argues, the traditional story of war promoting state development does not apply to Latin America. Despite a variety of internal and external military conflicts, no fiscal state was produced because, as Centeno demonstrates, there was a lack of establishment of prior political authority.

[33]This is perhaps granting Hamilton a dominance in early U.S. politics that he did not necessarily have.

As Helleiner (1999) points out, national monetary reforms happened at the pace of the broader political project of state building. Thus, the slower pace and incomplete results of some of the former Spanish and Portuguese colonies reflect the degree to which these nations had an interest in state building. Mexico, for instance, only accomplished many of the necessary reforms after the turn of the century, driven by the postrevolutionary state. Thus, the ambitious internal projects of the Cardenas government generated fiscal requirements that eventually led to a monopoly over paper notes. It was under the Cardenas government as well that the central bank gained regulatory powers and the ability to manage the exchange rate (Maxfield, 1990).

The U.S., however, had established the basic components of a modern financial system soon after the Revolution. Sylla (2001) claims that the resulting ability to rely on domestic financial markets for funding public debt was a "key difference between the United States and most other countries of the New World" (p. 246).

The roots of the nondevelopmental features of many Latin American states may be traced back to the colonial experience and the lack of a national bourgeoisie, as argued by Cardoso and Faletto (1979). It is likely also related to the way in which the nation states earned their independence. In contrast, Egnal (1975) has argued that the U.S. Revolutionary War was a consequence of external events that threatened the economic independence of a colonial merchant class. Thus, while the U.S. revolution was marked by a drive for economic independence, Landes (1999) has argued that it was essentially Spanish and Portuguese weakness at home that produced revolution in Latin America. Additionally, external funding for U.S. independence came partially in the form of loans but also in the

form of outright transfers from the French, who had significant interest in seeing the British defeated. The funding of Latin American independence, by contrast, marked the first large wave of sovereign lending and defaults in world history (Dawson, 1990).

We thus see that the major contrast between the former North and South American colonies has been in terms of the fiscal powers of the state and financial development which is rooted in their respective colonial experiences. If this is the case, the notion of the liberal state as the main driver of economic history should be replaced. Additionally, it could be argued that modern policy recommendations that emphasize independent institutions and the absence of state intervention rely essentially on historical myths.

CHAPTER 3

FROM PERIPHERY TO CENTER

Introduction

Between the Revolutionary War and the close of the 19th century, the United States went through major economic transformation that propelled it from a relatively small economy on the periphery amidst large European powers to the dominant manufacturer in the world. The sources of this economic growth given by most economic historians reference the development of supply side factors. The savings preferences of the community, the growth of population, the expansion of natural resources, and the advancement of technology are then generally argued to determine the pace of output growth.

However, an alternative view of growth, the "Keynesian hypothesis," sees aggregate demand as the source of growth not only in the short-run, but in the long run as well (Garegnani & Palumbo, 1999). That is, in the long run, savings are generated by income growth, but do not determine it. Growth is then determined by the level of autonomous spending over the long period. Though Keynes himself dealt with the principle of effective demand primarily in the short period, Nicholas Kaldor (1966) worked to extend the principle to the long period where the process of accumulation

results in changes the productive capacity of the economy.[1] In Kaldor's extension, he suggests that the level of effective demand required for full employment may be at odds with equilibrium in the balance of payments.[2] The structure of production of a country may generate a tendency toward trade imbalances that cannot be financed indefinitely. In what follows, we argue that the position of the United States in international trade and finance meant that for much of the 19th century, its growth was checked by external constraints on demand and not by the long run growth of factor supplies or technology. British monetary hegemony after the end of the Napoleonic wars meant that the adjustment of the balance of payments was asymmetric throughout the period. While the British learned to manage capital flows (and thus the balance of payments) through the Bank of England's monetary policy, the U.S., with no strong monetary authority, and a currency that had not achieved reserve status, was not so fortunate. However, as the century drew to a close, the internal development of industry and financial markets enabled the U.S. to reduce and eventually eliminate the balance of payments constraint.

In what follows, the hypothesis that the balance of payments acted as a constraint on domestic growth is explicitly tested. First, we establish the lack of a role for trade in traditional stories about U.S. growth over the 19th century. This is primarily the result of a focus on the supply side determinants of growth. Next, the balance of payments constraint is

[1] The literature extending Keynes to the long run begins with Harrod's (1939) seminal contribution.

[2] Kaldor, in his early work, primarily worked under the assumption of full employment. Camara-Neto and Vernengo (2010) have suggested that Kaldor's shift toward a demand led growth model may have been influenced by the decline of the pound as an international reserve currency which resulted in balance of payments problems. It is worth noting that in this paper, we examine the opposite movement for the United States, that is, the development from a peripheral country to a central one with a reserve currency.

formalized along the lines suggested by McCombie and Thirlwall (1994). The requisite import elasticities are estimated in both the short and long run. We conclude by noting that the balance of payments predicted growth rate is a remarkably accurate predictor of actual growth. In addition, the external constraint fell after the Civil War as a result of a decline in the income sensitivity of imports.

Supply, Demand, and Trade in Economic History

The role of trade in the rapid economic transformation of the United States in the 19th century was for a time among the central issues of economic history. In particular, D. North (1961) famously argued for the central importance of external trade and inter-regional trade in U.S. economic growth. Thus, in the antebellum period at least, cotton was king and drove internal expansion.[3] Very soon after, however, the notion that exports could lead growth came under criticism. Kravis (1972), Goldin and Lewis (1980), and others have argued that due to the relative small size of the external sector to GDP, it could not be of major influence.[4] Lindstrom (1983) has argued that the external view of growth in the 19th century suggests that resources would have been underutilized otherwise, a proposition she summarily rejects. She concludes that, "Demand-oriented models falter when they attempt to explain long run growth..." The replacement of the earlier models emphasizing the external sector came on the heels of Solow's famous growth decomposition.[5]

[3]This has much in common with the so-called "staple" theory of early growth made popular by Harold Innis in the Canadian context. See for example, Innis (1967).

[4]Engerman (1977) review of the research since North's book suggested that while it posed interesting questions, the main thesis of export led growth had fallen out of favor.

[5]It is also around this time that the demand view of the industrial revolution, famously argued by Gilboy (1967) and then Landes (1969) and Deane (1979), came under fire.

As Crafts (2009) has argued, the growth accounting approach has dominated much of the thinking about long run economic growth in economic history since.[6] Growth decompositions have suggested that growth was primarily attributable to the expansion of labor and capital supplies, with a smaller role for total factor productivity than in the modern period.[7] The supply side vision of growth thus leaves little room for the role of international trade. As Lipsey (2000) argues, "A view of the economy as governed by some type of economy-wide production function in which inputs of factors of production lead to predictable outputs of product tends to find little room for any influence of trade."

Indeed, standard macroeconomic theory has restored the Wicksellian postulate of the natural rate of interest, adding to that the notion of a natural rate of unemployment. In the long run then, forces are brought about that restore the rate of interest and the rate of unemployment to their natural level. That is, in the long run, it is supposed that demand adjusts to the natural capacity of the economy. It should be clear, then, that extending the principle of effective demand to the long run involves first rejecting the notion of an exogenous natural capacity determined by the growth of factor supplies and the (exogenous) rate of technological progress. The movements of labor both internationally and regionally, the responsiveness of investment to the accelerator mechanism, and westward land expansion suggest that it may be inappropriate to characterize growth in the 19th century as deriving from exogenous factor growth. As Irwin (2002), in reference to the 19th century, argues, "factors such as capital investment or population growth are apt to be endogenous and not exogenous deter-

See Mokyr (1977) for a review of the debate on the relative importance of supply and demand forces in the industrial revolution.

[6] See for instance, Abramovitz and David (2001).

[7] See for instance, Atack and Passell (1994)

minants of growth." We may add that the responsiveness of productivity to output growth (or what has come to be called Verdoorn's law) and the existence of "learning by doing" suggest that we may also be skeptical of an exogenous rate of technological progress.

In addition, international trade is often seen as following the rules of comparative advantage and the price-specie flow mechanism. Modern views of the international monetary system during the 19th century tend to see adjustments to the balance of as occurring relatively smoothly through the price mechanism, and an international division of labor that is determined by resource endowments. Indeed, Eichengreen (1998) argues for what can be seen as a version David Hume's price-specie-flow mechanism. To the classical price-specie-flow mechanism, Eichengreen adds international capital flows and a central bank that can make interest rate adjustments. This reflects the observation that actual gold flows were inconsistent with Hume's model, and capital flows were perhaps even more important than trade flows. Thus, during the classical gold standard, adjusting monetary policy (and keeping public debt in line) in order to maintain the parity with gold (or a currency tied to gold) becomes the "rules of the game." However, the fundamental mechanism of adjustment remains essentially the same as Hume's original argument.

However, as pointed out by De Cecco (1974) among others, when it comes to external finance, not all countries are created equal. For some countries, adjustment to payments imbalances required large income movements, while in others, the any payments problems could be solved by small adjustments in monetary policy. The international financial system can then be seen as resting on a center-periphery divide. England supplied long-term capital to the rest of the world, which returned to England

in the form of demand for exports and short-term capital through adjustments in the discount rate. In addition, international capital flows were often destabilizing, particularly for the periphery. Thus, adjustments to payments imbalances were achieved through income changes via the Harrodian trade multiplier.

For much of the 19th century, the British were able to settle their chronic balance of payments deficits in sterling. That is, short-term inflows allowed a permanent deficit on goods, and long-term outflows.[8] Though it could be said that the British only adopt a gold standard after the passage of Robert Peel's Act of 1844, the sterling bill was effectively an international currency prior to this. In addition, Hawtrey (1965) argues that the discount rate of the Bank of England began to be used as a tool of monetary regulation after the Bank Charter Act of 1833.[9] The expansion of British debt during the Napoleonic Wars (to around 250% of GDP) led to a growth in the size of financial markets, so that not only were consols widely traded, but other private bonds and equities found a larger number of buyers. In addition, the Rothschild, flush from earnings on Napoleonic war consols, began to impose a requirement that foreign borrowers borrow in sterling, and make interest payments in London Ferguson (2008).

It is no surprise, then, that the first wave of Latin American sovereign defaults occurs in the 1820s as British capital finds itself in the business of floating loans on behalf of foreign governments (Dawson, 1990).

[8] Short-term inflows result from peripheral surplus countries that invest in short-term British assets rather than accumulating gold. In addition, nonfactor services, investment income, and trade within the empire (particularly India) all play a role. See De Cecco (1974) on the role of short-term inflows and the role of trade within the empire during the classic gold standard. See Esteban (2001) on the role of India in the earlier part of the century. Baghestani and Mott (2009) estimate the long run quantity equation for Britain during the gold standard, and suggest the error correction terms reflect British management of gold reserves.

[9] Hawtrey (1965) argues that the notion of using the discount rate as a policy instrument originated with Henry Thornton 30 years earlier.

But of course, it is just a decade later that several U.S. states default on their external obligations, which were primarily owed to British banking houses. The dominance of sterling in international transactions meant also that the British were able to finance trade deficits without the problem of mounting external debts in foreign currency, sometimes called the problem of "original sin."[10]

The role of sterling in international finance led to a stylized cycle between England and peripheral nations. Long waves of increasing external debt and subsequent default among peripheral countries began in the 1820s and continued throughout the 19th century. In each wave, the British were the primary lenders Suter (1992). Though the details differ, a pattern emerges in which rising commodity prices (coinciding with faster British growth) result in imported inflation, which then results in a sharp increase in British discount rates. This caused a decline in peripheral commodity prices through demand effects, exchange rate effects and liquidation of commodity stocks by merchants. The capital flight back to Britain also caused a decline in expenditures in the periphery, and would very often prompt defensive interest rate increases. With high interest rates, falling incomes, and low export prices, debt commitments in the periphery quickly became unsustainable.

The United States had not yet achieved "key" currency status during this period, and was thus vulnerable to the instability of capital flows. In addition, for at least the antebellum period, U.S. exports were dominated by a single commodity export, cotton. It was thus subject to persistent trade deficits, which it was not always able to finance with capital inflows. A reduction of imports through a reduction in income was then often the

[10]See Eichengreen and Hausmann (1999)

result.

The Harrodian adjustment to external imbalances then fits with the view of the international financial system as being characterized by a center and periphery. The income adjustment mechanism just described has been revived by Thirlwall (1979), who argues that for many countries, the rate of growth consistent with balance of payments equilibrium may be less than the rate consistent with full utilization of resources. In what follows, we explicitly test the balance of payments constraint hypothesis (sometimes known as Thirlwall's law) for the U.S. over the 19th century.

The Balance of Payments Constraint

As discussed, the view of the 19th century as being characterized by a center-periphery dichotomy suggests that for the U.S., the expansion of domestic demand may lead to balance of payments difficulties before growth reaches its short-term capacity limit. Exports then take on a particularly important role, as the sole source of demand that does not cause balance of payments deterioration. The constraint can be derived quite simply from the balance of payments equilibrium.

Consider a country whose balance of payments is in equilibrium:

$$P^d X = E P^f M \tag{3.1}$$

where P^d is the price of exports, X is the quantity of exports, E is the nominal exchange rate (domestic price of foreign currency), P^f is the price of imports in foreign currency, and M is the quantity of imports. Log differentiation yields the growth rates:

$$p^d + x = e + p^f + m \tag{3.2}$$

The growth rate of GDP consistent with balance of equilibrium can be derived by introducing standard (constant elasticity) demand functions for exports and imports:

$$M = a(\frac{P^f E}{P^d})^{\psi} Y^{\pi}; \psi < 0, \pi > 0 \tag{3.3}$$

$$X = b(\frac{P^d}{P^f E})^{\eta} Z^{\epsilon}; \eta < 0, \epsilon > 0 \tag{3.4}$$

where a and b are constants, ψ and η are price elasticities, π and ϵ are income elasticities, and Z is world income. Price elasticities are negative, and income elasticities positive. In growth form, equations (3.3) and (3.4) become:

$$m = \psi(p^f + e - p^d) + \pi y \tag{3.5}$$

$$x = \eta(p^d - p^f - e) + \epsilon z \tag{3.6}$$

Substituting equation (3.5) and equation (3.6) into equation (3.2) yields the rate of growth consistent with balance of payments equilibrium:

$$y^b = \frac{(1 + \eta + \psi)(p^d - p^f - e) + \epsilon z}{\pi} \tag{3.7}$$

The standard version of Thirlwall's law assumes that in the long run, capital flows are zero and relative prices in domestic currency $(p^d - p^f - e)$

do not change.[11] In this case, equation (3.7) reduces to:[12]

$$y^a = \frac{\epsilon z}{\pi} = \frac{x}{\pi} \tag{3.8}$$

The above suggests that the primary sources of growth for a balance of payments constrained country are a reduction in the income elasticity of imports (perhaps through the development of import competing industries), or improved export performance.

For some countries, a stable level of capital inflows may allow it to grow faster than the rate of growth suggested by equation (3.8), even in the long run. To deal with this possibility, several authors have developed augmented versions of Thirlwall's law to allow for capital flows. Thirlwall and Hussain (1982) extended the model to allow for unlimited foreign capital flows. Moreno-Brid (1999) extended the model to restrict the implied growth rate to a level consistent with sustainable growth of foreign debt. More recently, Moreno-Brid (2003) has incorporated foreign interest payments.

Following Britto and McCombie (2009), if capital flows are allowed for, the dynamic balance of payments identity described in equation (3.2) becomes:

$$\theta_1(p^d + x) - \theta_2(p^d + i) + (1 - \theta_1 + \theta_2)(p^d + f) = e + p^f + m \tag{3.9}$$

where i is the growth of real net interest payments, and f is growth of the net inflow of capital. In addition, θ_1 and θ_2 reflect the proportion of exports

[11] This is in contrast to other theories of the balance of payments that emphasize exchange rate and relative price adjustments.

[12] This reduction is also the case if the Marshall-Lerner condition holds exactly (i.e., $1+\eta+\psi = 0$). As pointed out by McCombie and Thirlwall (1994), equation (3.8) is a dynamic version of the classic Harrod foreign trade multiplier.

covered by imports and the proportion of interest payments covered by imports, respectively. To prevent explosive growth of external debt relative to GDP, the following condition is imposed:

$$f = y \tag{3.10}$$

The resulting balance of payments constrained growth rate is:

$$y^b = \frac{(1 + \theta_1\eta + \psi)(p^d - p^f - e) + \theta_1\epsilon z - \theta_2 i}{\pi - (1 - \theta_1 + \theta_2)} \tag{3.11}$$

If relative prices are again assumed constant:

$$y^b = \frac{\theta_1 x - \theta_2 i}{\pi - (1 - \theta_1 + \theta_2)} \tag{3.12}$$

The version of Thirlwall's law in equation (3.12) suggests that the balance of payments may be improved by improvement in export growth and import propensities as before, but it adds the decrease in net interest payments. Of course, the interest burden may be out of the control of domestic policy makers, particularly if the debt is denominated in foreign currency. In the next section, we will see how well the various versions of Thirlwall's law fit the U.S. growth experience.

Testing the balance of payments constraint can be done in several ways. Most work relies on two methods.[13] First, equation (3.7) is directly estimated. A significant coefficient on the growth of foreign income and a zero or insignificant coefficient on relative prices will confirm Thirlwall's law. A second method first estimates the income elasticity of imports, and then tests how well the growth rate implied by equation (3.8) matches the actual growth rate. This can be done either by examining whether the actual

[13]McCombie and Thirlwall (1994) summarize the empirical work.

growth rate of GDP is significantly different than the balance of payments constrained growth rate, or by testing whether the actual and implied income elasticities of imports are significantly different.

In this paper, given the long run nature of our study, we opt for the latter method. Import functions for the U.S. are estimated over the century using the ARDL approach to cointegration, as described by Pesaran, Shin, and Smith (2001). The income elasticity of imports is then tested against the elasticity implied by both the standard version of Thirlwall's law, and the version allowing for capital flows.

The Data

As with many historical time series, the data used here become less reliable the further one goes back in time. Of the data used in this study, the estimates for GDP are likely the least reliable. The prospective econometrician is warned against placing much faith in the short-term fluctuations of GDP estimates prior to 1929. Instead, it is generally accepted that these estimates indicate the "pace and pattern" of economic growth rather than its short-run changes (Sutch, 2006b). The purpose of this study is to generate rough approximations of the relationship between the balance of payments and economic growth during the 19th century, and the extent to which the implied relationships change over long periods. We may be concerned about the quality of GDP data, but we can also take comfort in not relying heavily on annual fluctuations.

The estimation of GDP prior to 1929 has been somewhat contentious. For our purposes, it would be inappropriate to review all the creative methods of estimating GDP for the 19th century here.[14] The long run series

[14]A nice summary of these efforts can be found in Rhode and Sutch (2006).

used in this paper is the "millennial estimates" series from the Cambridge Historical Statistics.[15] This series combines the David (1967) and Weiss (1992) estimates for the antebellum period, and the so-called "standard" series for the postbellum period.[16]

Four sets of import price indices are available for the period under consideration. In North's (1961) seminal work, he calculates two sets of import price indices. One covers the years 1790 to 1815, the second from 1815 until 1860. Simon (1960), seeking to extend North's work, and using the same methodology, computes an import price index for the years 1861 to 1879. Finally, Lipsey (1963) calculates an import price index between 1879 and 1929. We construct a rough series for real imports between 1800 and 1900 using North, Simon, and Lipsey's series. The three price series were combined, and the base year was set at 1860. An export price index was constructed similarly. In addition, data on exports and imports are derived from the same sources, as compiled by Edelstein (2006).

As with the trade price indices, no single domestic price series overwhelmingly lends itself to our purpose. Often, the implicit price deflator is used in estimations of import demand functions. Ideally, one would use an index of the prices of domestic substitutes for foreign goods. This, of course, is quite difficult. Perhaps the most heavily relied on domestic price index for the antebellum period is the Warren (1932) index of wholesale prices. It is often used as a general indicator for prices in the antebellum period. Indeed, the David and Solar (1977) cost of living index makes use of the Warren series (among others) weighted by estimates of household expenditures. Johnston and Williamson (2007) construct an

[15] Table Ca9 in Sutch (2006a).

[16] The "standard" series, so named by Balke and Gordon (1989), is commonly used and has held up relatively well to new methods of estimation.

implicit GDP deflator using benchmark years, interpolating the years in between with David and Solar's series. To construct relative prices, we use the David and Solar series, as the weighting for household expenditures is relevant considering a good portion of imports were for domestic consumption throughout the 19th century.

J. G. Williamson (1964) has argued for long waves of about 15 years or so in the balance of payments that roughly coincide with domestic long swings. The cycles that Williamson notes can clearly be seen in our data. In the following sections, we will examine the causality among these series from a balance of payments constraint perspective. Table 3.1 summarizes the peaks and troughs indicated by the Hodrick-Prescott filter.

A few things can be noted from Table 3.1. The first is that long swings in the goods balance seem to last about 10 years from peak to trough, and in general seem to be driven by fluctuations in imports. Imports and exports seem to move together prior to the 1870s, but the amplitude of import fluctuations dominates movements in exports.

Table 3.1: Long Run Peaks and Troughs in GDP, Imports and Exports

Imports	Exports	GDP
1825 (trough)	1832 (trough)	-
1832 (peak)	-	1830 (peak)
1839 (trough)	-	1839-40 (trough)
1848 (peak)	1851 (peak)	1851-53 (peak)
1860-61 (trough)	1861 (trough)	1866 (trough)
1869 (peak)	1872 (peak)	-
1876 (trough)	-	-
1882 (peak)	1883-84 (trough)	1879 (peak)
1895 (trough)	1896-97 (peak)	1892 (trough)

Sources: See text. Timing of long cycles is derived from a Hodrick-Prescott filter

In addition, these movements seem to be associated with changes in GDP growth rates. That is, faster GDP growth, growth in exports, and growth in imports all seem to coincide. After 1870, this relationship breaks down as GDP now moves against exports and with imports.

Terms of trade movements over the 19th century show a similar pattern, as can be seen in the plot of the filtered long run and short term cyclical series in Figure 3.1. Prior to 1870, rapid increases in the terms of trade are associated with faster growth, and a deteriorating balance of payments. Large negative shocks seem to coincide with balance of payments correction and slow GDP growth. After 1870, the amplitude of shocks is much smaller compared with previous years, though cycles can still be detected in the mid-1870s and mid-1880s that roughly precede recessions.

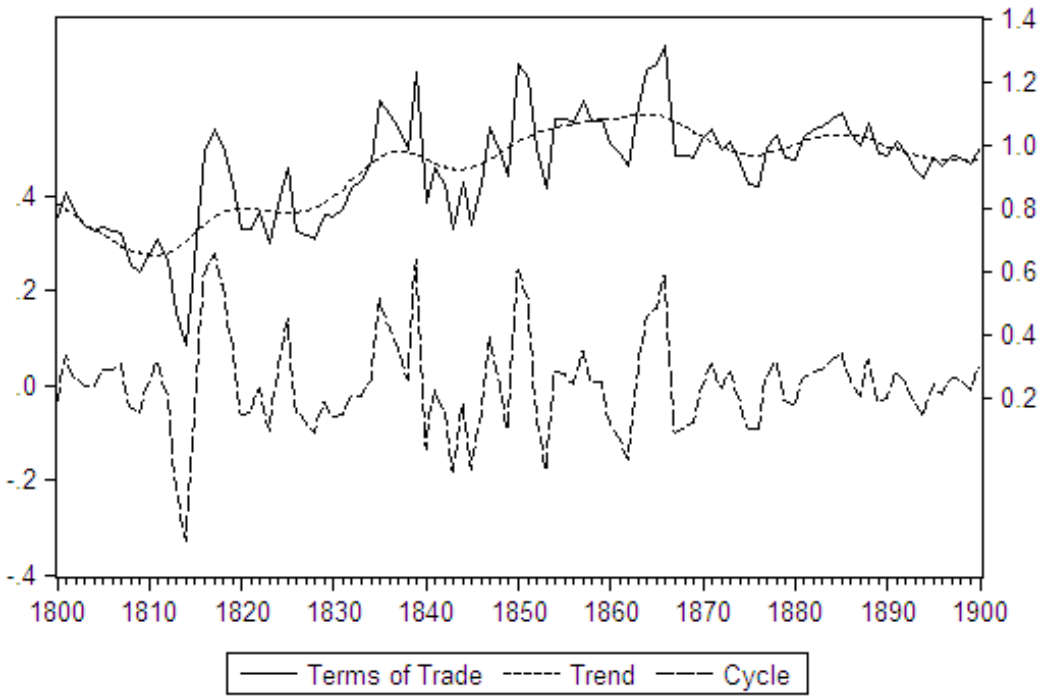


Figure 3.1: Hodrick Prescott Filter of the Terms of Trade Series

Estimates of 19th-Century Trade Elasticities

Before estimating the import demand function, we need to first investigate the properties of our time series variables. Since at least C. Nelson and Plosser (1982), it has been common for researchers to examine the stationarity of time series to avoid spurious results. In order to identify unit roots in the data, we perform augmented Dicky-Fuller (ADF) tests on the variables and their first differences. The results, presented in Table 3.2, suggest that our data are nonstationary in levels, but stationary in first differences.

However, ADF tests potentially confuse structural breaks in the series as evidence of nonstationarity. Though a host of tests exist to test for unit roots in the face of structural breaks, a particularly useful approach is that developed by Clemente, Montañes, and Reyes (1998). These tests, based on Perron and Vogelsang (1992), allow up to two unknown structural breaks in the mean of the series. In addition, both of the tests (for one and two structural breaks) allow for sudden breaks in the mean (additive outliers) and gradual shifts in the mean (innovational outliers).

Table 3.2: Augmented Dickey Fuller Test for Unit Roots

Variable	Constant	No Constant	Trend and Constant	Judgment
y	-0.527	7.79	-3.049	I(1)
$\triangle$y	-9.921***	-5.066***	-9.883***	I(0)
im_t	-0.399	2.593	-3.25*	I(1)
$\triangle$im	-5.244***	-4.208***	-5.226***	I(0)
dsrp	-2.95	-0.697	-3.249	I(1)
$\triangle$dsrp	-7.174***	-7.175***	-7.159***	I(0)

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.
The null in a ADF test is that the variable has a unit root. Lags were suggested by AIC and SBIC.

The results of the unitroot tests in the face of structuralbreaks are presented in Table 3.3. The presence of structural breaks is detected for all variables, and unsurprisingly, the dates of endogenously chosen structural breaks mostly coincide with the Civil War. However, we still cannot reject the presence of a unit root for GDP and imports. The original rejection of the stationarity of relative prices, however, is called into question.

To proceed with further estimation, we need to examine the potential long run cointegrating relationship. If we were sure that all the variables were I(1), the standard Johansen (1991) approach to cointegration would be appropriate. Given the doubt introduced by the above unit root tests, we should be wary about proceeding in this fashion. An alternative approach developed by Pesaran et al. (2001), based on an autoregressive distributed lag (ARDL) model, allows the testing of cointegrating relationships in the face of variables with mixed orders of integration.

Indeed, this approach has been increasingly common in the estimation of import demand functions.[17] The ARDL approach has other desirable properties as well. In general, it can deal better with small sample bias, which is important as our data is annual, and allows flexibility in the lag structure of dependent variables (as opposed to cointegration VAR models). The ARDL model involves estimating the following equation by OLS:

$$\Delta y_t = a_0 + a_1 t + B_1 y_{t-1} + \sum_{j=2}^{k} \beta_j x_{j,t-1} + \sum_{i=1}^{l} \theta_{1i} \Delta y_{t-i} + \sum_{j=2}^{k} \sum_{i=0}^{q} \theta_{ji} \Delta x + u_t \qquad (3.13)$$

In the above, βs can be interpreted as long run multipliers, and the θs can be interpreted as reflecting the short-run dynamics. The lag structure is indicated by l and q. Following the estimation of equation (3.13), an

[17] See for instance Narayan and Narayan (2005), Bahmani-Oskooee and Goswami (2004), or Ghosh (2009).

Table 3.3: Clemente-Montañés-Reyes Tests for Unit Roots

Single Break

	Additive Outliers		Innovational Outliers	
Variable	t-stat	t-stat	t-stat	t-stat
y	14.80***	-1.99	1.438	-1.212
$\triangle$y	0.12	-6.13**	-0.84	-11.93**
im_t	17.67***	-1.77	1.96*	-1.89
$\triangle$im	0.67	-7.09**	1.30	-10.39**
dsrp	-7.67***	-3.45	-3.59***	-4.283**
$\triangle$dsrp	-0.01	-3.17	1.167	-4.546**

Double Break

	Additive Outliers			Innovational Outliers		
Variable	t-stat	t-stat	t-stat	t-stat	t-stat	t-stat
y	15.41***	12.12***	-2.88	1.98**	1.52	-1.95
$\triangle$y	2.70***	-2.87***	-9.97**	3.31***	-3.67***	-8.87**
im_t	12.02***	11.41***	-2.286	5.16***	1.63	-2.65
$\triangle$im	0.68	-0.143	-6.74**	6.03***	-5.25***	-13.66**
dsrp	-7.16***	3.59***	-4.52	-5.70***	4.68***	-5.83**
$\triangle$dsrp	-5.80***	6.05***	-5.68**	-5.52***	5.86***	-6.66**

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

F-statistic is calculated, testing the joint hypothesis that the coefficients on all lagged level variables are equal to zero:

$$\begin{aligned} H_0 &= \beta_j = 0,\ j = 1, ..., k \\ H_a &= \beta_1 \neq 0\ j = 1, ..., k \end{aligned} \tag{3.14}$$

However, under the null hypothesis presented above, the asymptotic distributions of the Wald statistics are nonstandard. Instead, the F-statistic is compared to the critical values presented in Pesaran et al. (2001), who

provide two sets of values, that provide the bounds.[18] If the F-statistic lies outside the bounds, the null can be rejected, and a cointegrating relationship exists. If a cointegrating relation is identified, the long run cointegrating vector can be extracted and an error correction model estimated.

Thus, we will proceed with cointegration tests using the ARDL bounds procedure. The ARDL model for import demand is estimated as follows:

$$\begin{aligned}\Delta m_t &= a_0 + a_1 t + \beta_1 m_{t-1} + \beta_2 y_{t-1} + \beta_3 rp_{t-1} + \sum_{i=1}^{l} \phi_{1i} \Delta m_{t-i} + \\ &\quad \sum_{i=0}^{q} \phi_{2i} \Delta y_{t-i} + \sum_{i=0}^{r} \phi_{3i} \Delta rp_{t-i}\end{aligned} \tag{3.15}$$

We then estimate equation (3.13) for our data between 1815 and 1900.[19] The lag structure is determined by minimizing the Schwartz criteria, as suggested by Pesaran et al. The calculated F-statistic and the relevant critical values are presented in Table 3.4 under various assumptions about the trend and intercept. The F-statistic lies well outside the bounds at the 1% level for all cases, and therefore, the null hypothesis of no cointegration can be rejected.

After establishing a cointegrating relation, we are free to estimate the long run cointegrating equation and short-run dynamics. The results are

Table 3.4: The ARDL Bounds Test for Cointegration in Import Demand

Calculated F-statistic		
Case 1	no intercept, no trend	6.12***
Case 2	intercept, no trend	40.57***
Case 3	intercept, trend	26.00***

The critical value bounds are taken from Pesaran et al. (2001).

[18] One set assumes all variables are I(1) and the other assumes that all variables are I(0).

[19] The date of 1815 was indicated by structural break tests. It also marks the defeat of Napoleon and the end of the War of 1812, which restored some degree of normality to international trade relations.

presented in Table 3.5. Case 1, although it yielded a long run cointegrating relation, was dropped as it is unrealistic and did not perform well. Extracting the long run cointegration relationship by normalizing on imports yields the following long run relationships for the equation with and without a trend, respectively:

$$m_t = 0.89y_t - 0.55rp_t \tag{3.16}$$

$$m_t = 2.52y_t - 0.68rp_t \tag{3.17}$$

While imports are most certainly inelastic with respect to prices, the income elasticity seems to vary quite a bit depending on the assumption about the underlying time trend. In addition, the short-run dynamics suggest that relative prices play a smaller role than income in adjusting to long run equilibrium.

Diagnostic tests suggest no problems of serial correlation, nonnormality, ARCH effects, or misspecification. Given the presence of structural breaks in the underlying data, however, we should be particularly wary about the stability of the parameters. The plots of the cumulative sum of recursive residuals and the cumulative sum of squared recursive residuals (the CUMSUM and CUMSUMSQ tests) in Figure 3.2 suggest that the parameters of the long run equation are relatively stable. A Quandt-Andrews test for an unknown break point (not reported here) suggests that there is indeed a break point around 1862, which is unsurprising.

Table 3.5: ARDL Estimates of the Import Demand Function 1815-1900

Dependent Variable: D(m)		
	No Deterministic Trend	Deterministic Trend
m_{t-1}	-0.74***	-0.73***
	[0.07]	[0.06]
y_{t-1}	0.66***	1.84***
	[0.07]	[0.37]
rp_{t-1}	-0.41***	-0.50***
	[0.11]	[0.11]
$D(m)_{t-1}$	-0.14*	0.11
	[0.07]	[0.07]
$D(y)_t$	0.89*	1.40***
	[0.47]	[0.47]
$D(y)_{t-1}$	0.07	-0.54
	[0.47]	[0.46]
$D(rp)_t$	-0.16	-0.09
	[0.27]	[0.26]
$D(rp)_{t-1}$	0.59**	0.66**
	[0.27]	[0.25]
Constant	-6.61***	-16.75***
	[0.74]	[3.19]
Trend		-0.05***
		[0.01]
R-squared	0.65	0.69
Adjusted R-Squared	0.61	0.66

*,**,*** reflect significance at the 10%, 5% and 1% levels, respectively.
Standard errors are in brackets.

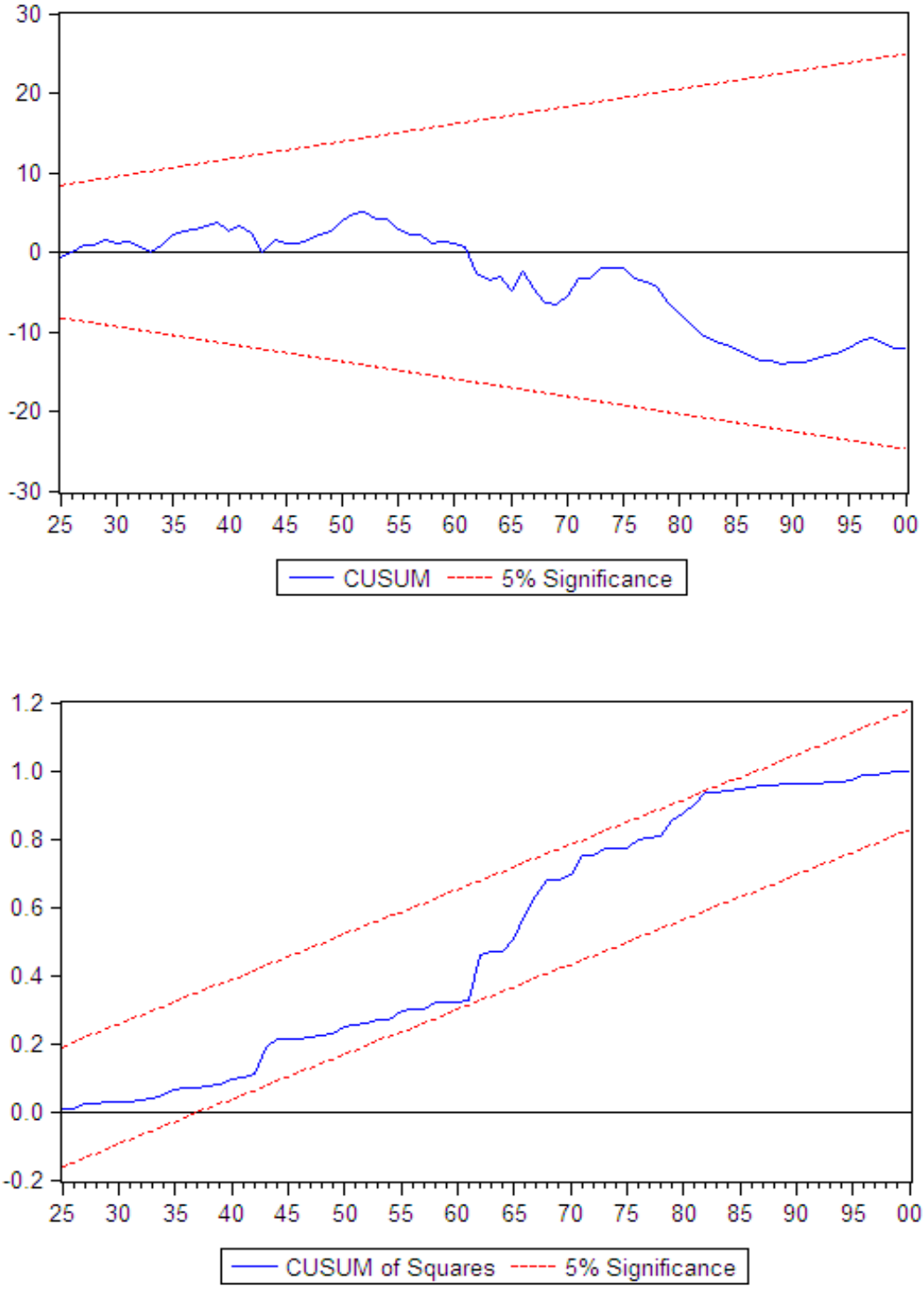


Figure 3.2: CUMSUM and CUMSUMSQ Tests 1815-1900

In order to avoid the problems of a possible structural break, the long run relationship was re-estimated for the antebellum and postbellum periods. The results of the short period regressions are presented in Table 3.6. Lags were again selected so as to minimize the Schwartz criterion. For the antebellum period, the following long run relationships were found:

$$m_t = 1.26y_t + 0.77rp_t \tag{3.18}$$

$$m_t = 3.30y_t - 0.39rp_t \tag{3.19}$$

For the postbellum period, the import demand functions are:

$$m_t = 0.78y_t - 1.19rp_t \tag{3.20}$$

$$m_t = 2.05y_t - 1.43rp_t \tag{3.21}$$

Equations (3.18) and (3.20) reflect the long run relationship estimated without a deterministic trend, while equations (3.19) and (3.21) reflect the relationship estimated with a trend.

Before using these elasticities to test the appropriateness of Thirlwall's law for the 19th-century U.S., a few comments on the cointegrating relationships are in order. The two periods are associated with somewhat different import demand functions. In the first half of the century, imports appear to be much more income sensitive and much less price sensitive. The coefficient on relative prices even takes on the wrong sign in equation (3.18). This is in some sense different from the common understanding of the operation of the balance of payments in the antebellum period.

Table 3.6: The Antebellum and Postbellum Import Demand Function

Dependent Variable: D(m)

	Antebellum (1815 - 1861)		Postbellum (1866-1900)	
	No Trend	Trend	No Trend	Trend
m_{t-1}	-0.88***	-0.98***	-0.41**	-0.39**
	[0.07]	[0.10]	[0.16]	[0.16]
y_{t-1}	1.11***	3.23***	0.32**	0.80**
	[0.11]	[0.52]	[0.15]	[0.37]
rp_{t-1}	0.68*	-0.38	-0.49***	-0.56***
	[0.36]	[0.38]	[0.17]	[0.18]
$D(m)_{t-1}$	0.18**	0.34***	-0.08	-0.15
	[0.07]	[0.10]	[0.18]	[0.18]
$D(m)_{t-2}$		0.02		
		[0.07]		
$D(m)_{t-3}$		0.18***		
		[0.06]		
$D(y)_t$	1.99**	2.78***	0.76*	0.95**
	[0.80]	[0.73]	[0.40]	[0.42]
$D(y)_{t-1}$	0.40	-1.35*	0.33	0.21
	[0.82]	[0.77]	[0.46]	[0.46]
$D(y)_{t-2}$	-0.43			
	[0.81]			
$D(y)_{t-3}$	2.13*			
	[0.80]			
$D(rp)_t$	0.43	-0.12	-1.37***	-1.29***
	[0.44]	[0.40]	[0.37]	[0.36]
$D(rp)_{t-1}$	0.08	-0.04	-0.39	-0.37
	[0.45]	[0.38]	[0.42]	[0.41]
Constant	-11.27***	-29.50***	-3.14*	-7.40
	[1.16]	[4.50]	[1.54]	[3.41]
Trend		-0.09***		-0.02
		[0.02]		[0.01]
R	0.85	0.89	0.70	0.72
Adj. R	0.81	0.86	0.61	0.62

*,**,*** reflect significance at the 10%, 5% and 1% levels, respectively.
Standard errors are in brackets.

For instance, Temin (1969) has suggested that in the antebellum period, "prices were flexible, they could vary to facilitate capital transfers, and they could change radically without destroying the ability of the economy to operate near capacity." The above equations suggest a Keynesian adjustment, with imports far more sensitive to income than relative prices. Thus, quite large shifts in relative prices would be required to bring imports in line with exports.

In the latter half of the century, imports become price elastic, and less income elastic. The decline in income elasticity and rise in price elasticity likely reflects the availability of domestic alternatives - that is, it reflects the substitution of imports. We will say more on the trend in elasticities in a later section, but the contrary movement of income and price elasticities over the 19th century should be clear. In what follows, we will test Thirlwall's law against the elasticity estimates provided in this section.

The Performance of Thirlwall's Law

To test the presence of a binding balance of payments constraint, we will compare our estimates of income elasticities to those predicted by Thirlwall's law in both its basic and extended versions. Table 3.7 presents the results. The growth of real net interest payments is proxied by the growth of payments on foreign assets from the Cambridge Historical Statistics, divided by our price index.[20] The growth of payments on foreign assets for our period is itself an estimate, derived by applying an estimated interested rate to the stock of foreign assets in the U.S.

The variables π ,y,i, and x represent the income elasticity of imports and the growth rates of real GDP, real foreign payments, and real exports, re-

[20]Table Ee9 in Edelstein (2006)

Table 3.7: Predicted and Actual Elasticities of Imports and Growth Rates

	1815-1900	1815-1861	1866-1900
$\pi_{notrend}$	0.89	1.26	0.78
π_{trend}	2.52	3.30	2.05
π_a	2.56	3.43	1.79
π_b	2.57	3.14	1.89
$y_{a,notrend}$	11.68	10.82	9.11
$y_{a,trend}$	4.13	4.14	3.47
$y_{b,notrend}$	9.54	10.65	9.23
$y_{b,trend}$	4.14	3.78	3.67
y_{actual}	4.06	3.97	4.17
θ_1	1.04	0.92	1.21
θ_2	0.10	0.06	0.15
i	6.38	7.76	5.67
x	10.4	13.63	7.11

spectively. The variables θ_1 and θ_2 are the export to import ratio and the foreign payments to imports ratio. The subscripts a and b indicate the version of the balance of payments constraint without and with capital flows. The subscripts $trend$ and $notrend$ indicated whether the income elasticity was estimated with a deterministic time trend or not.

The balance of payments constraint model in both of its forms performs remarkably well. Clearly, the estimates derived with a deterministic time trend give more reasonable results. Formal Wald tests on coefficient restrictions for the trend estimates suggest that neither the standard nor the capital augmented versions of the balance of payments constraint can be rejected. During the 19th century, the U.S. faced income adjustments to balance its foreign payments, which constrained its rate of growth.

The results imply that a higher rate of growth in the postbellum period was allowed only because of a sharp reduction in the propensity to import. That is, with a much lower rate of export growth, the U.S. would have had persistent balance of payments problems in the postbellum period

had it not substituted away from imports. In addition, as we shall note momentarily, the growth of foreign payments was of a different nature, and this implied that the instability of foreign capital played less of a threat.

Finally, mention should be made of the role of relative prices and the terms of trade during this period. As we noted earlier, the hypothesis suggested by McCombie and Thirlwall (1994) that relative prices play little role in import demand is confirmed. This implies a Keynesian adjustment on the balance of payments. When large current account deficits emerged, and foreign capital dried up, a collapse in domestic demand followed that reduced import demand. Import prices declined relative to domestic prices throughout the century, and particularly drastic was the decline during the Civil War years. To the extent to which export prices grew, the terms of trade improved, although after 1840 the trend is negligible. What is more noticeable in the terms of trade is the absence of major terms of trade shocks after the Civil War, as noted earlier. On the whole, however, it seems clear that price adjustments could hardly play the primary role in correcting foreign payments imbalances.

The evidence of income as the primary adjustment mechanism to external imbalances seems clear enough. As noted earlier, this was not necessarily the case for England, who was able to force some of the adjustment onto the periphery.[21] Over the 19th century, as we have seen, the U.S. was able to reduce its propensity to import. In addition, towards the end of the century, economic actors in the U.S. were increasingly able to issue foreign debt denominated in dollars, and the dollar became more important in global finance, as described in the second chapter.

[21] Though as Ford (1964) points out, the manipulation of the discount rate had consequences for British exporters.

Conclusions

We have argued that the 19th-century international financial system was characterized by a distinction between center and periphery. For England, the balance of payments did not restrict demand due to the role of sterling in international finance. Other countries had to borrow in sterling or as debtors (in the case of the U.S.) had difficulty in managing capital flows. Financial dependence and the balance of payments constraint were thus two sides of the same coin for many countries. The growth rate predicted by balance on foreign payments is remarkably close to actual growth. Thus, the U.S. faced income adjustments to disequilibrium in the balance of payments, though the constraint was relaxed by the second half of the century. In addition, we have argued that the shift after the Civil War was a matter of type and not just size. The ability of entities in the U.S. to issue debt denominated in domestic currency and avoid some of the problems of capital inflow was positively impacted by the development of a fiscal military state in the middle of the century.

The ability of the balance of payments constraint to predict growth so accurately suggests that trade and external finance should be given a somewhat larger role in U.S. economic history than is normally the case. This paper suggests that the U.S. found itself in situation of financial dependency, with external constraints on growth, that was similar to that of Latin America. However, we have suggested a possible difference between the former colonies explaining their divergent growth paths that may have been overlooked. The transformation of the balance of payments constraint in the U.S. was the result of an alliance between domestic elites and a burgeoning fiscal-military state. By the 1890s, the U.S. had established itself as the dominant manufacturer in the world, and the dollar was

on the brink of becoming a key currency. As Baghestani and Mott (2009) argue, by this period, U.S. and British prices had a long run relationship that British prices adjusted to. In addition, Huffman and Lothian (1984) argue that while British business cycles had causal effects on U.S. business cycles in the antebellum period, after the Civil War, the relationship reversed. Meanwhile, Latin America was in the midst of what Mitchener and Weidenmier (2007) have called a "meltdown." If the balance of payments is the relevant constraint for these Latin American countries, the difference between their growth paths and that of the U.S. might not have been geography, culture, or institutions, but the nature of the state.

Finally, the presence of a situation of financial (and not just trade) dependence starting in the early 19th century suggests that the fundamental problem of the balance of payments constraint and dependency is present under a variety of monetary arrangements. Indeed, as Vernengo (2006) points out, the present hegemony of the dollar has meant that the collapse of Bretton Woods and industrialization among the periphery did little to break the cycle of dependency.

CHAPTER 4

ASSYMETRIC ADJUSTMENT IN THE JACKSONIAN ERA

Introduction

The crisis years 1837-1843 in the U.S. have long occupied the imagination of economic historians. By some accounts, the crisis (or series of crises depending on one's perspective) counts among the worst in the nation's history. The period has of course also drawn the attention of political and social historians as it represented a widespread change in the structures of American life.

Debates surrounding the period have focused on the economic policy pursued by Jacksonians. Among economists, the debate over the merits of Jackson's famous economic endeavors has focused on whether the economic troubles of the period originated within the nations borders or from without. The simultaneous difficulties in Great Britain prompted some, most notably Temin (1969), to see the crisis as tangential to Jackson's policies which may have made things worse but were not the root cause. A tradition among early historians of the period, one that has become more popular of late, holds that the destruction of the Second Bank of the United States and the reorganization of the nation's specie reserve produced the crisis. Both interpretations, however, have tended to focus on the quantity

of money as the primary cause of the price and output fluctuations of the period. Additionally, some have even suggested that the period was primarily characterized by a strong deflation rather than declines in the level of activity.

A relatively ignored element of the crisis has been the assymetric method by which the U.S. and Britain adjusted to shocks in the balance of payments. This paper argues that the 1837-1843 crisis is an early instance of asymmetric adjustment mechanisms under a specie standard. The extent to which the severity of the crisis can be attributed to external or internal causes can be difficult to parse out. However, certain structural features of the British and U.S. economies imply that the adjustment to a balance of payments may have been stabilizing in terms of output for the one, but destabilizing for the other. That is, though intervening variables make assigning blame difficult, we can suggest that all else equal external adjustment implied changes in income in the U.S. but not necessarily in Britain. The asymmetric pattern of adjustment can be seen throughout the 19th century in British dealings with the peripheral countries of the world. British stability, it will be argued, was the result of peripheral instability. Thus, the changes in income in the U.S. in the 1830s and 1840s were directly related to stabilizing forces in Britain.

The role of London as the center of international finance had been established, in a preliminary form, after Waterloo. Additionally, it is during this period that British industrial expansion began to take off. This was intimately related to external markets both in terms of the share of exports in manufactures (Esteban, 1997) and import demands of primary commodities (Harley, 2004). The dominance of the British in the trade of many countries including the antebellum U.S. meant that short-term

credit denominated in pounds was in high demand. The importance of London in international capital markets then meant that it could, with changes in the Bank of England's discount, attract capital from around the world almost at will. In addition to attracting capital, British financing of the commodity trade implied that British discount policy was a major factor in the determination of commodity prices. Thus, in the presence of a balance of payments deficit, the British could raise rates, attract capital, and adjust their terms of trade.

In the U.S., however, when capital returned to London, even very high interest rates could not reverse the tide. In addition, export revenues declined as commodity prices fell. With external debts accumulated in pounds, debt service burdens grew and eventually led to default. In order to meet the challenge of capital flight, the U.S. had to adjust spending and income to bring imports in line with (reduced) exports. Capital flows, prices, and the level of exports all became destabilizing.

For the British, commodity price movements and capital flows served to lessen the adjustment burden. In what follows, it will be argued that this feature of asymmetric adjustment has been relatively ignored in the current literature. The Keynesian adjustment mechanisms that described the classical gold standard are thus equally applicable at the beginning of the century.[1]

After reviewing some key features of the antebellum economy, the existing literature is surveyed and then the balance of payments adjustment mechanisms discussed. The paper concludes with a note on the surprising similarity between the U.S. cycle and cycles among peripheral countries in the 19th century.

[1]See (Bordo & Schwartz, 1984) for a summary of views of the classical gold standard.

Background

The economic issues of the 1830s and 1840s in the United States have been the focus of a great deal of controversy. It would be prudent then to begin with a short survey of the buildup and subsequent damages left by a period of economic distress considered among the worst in U.S. history, which eventually resulted in the default of nine states.

1830 marked in many ways, a turning point for the United States both in its economics and its politics. The U.S. experienced a period of prosperity for much of the 1830s characterized by the rise of domestic manufactures, an expansion of trade, particularly with Britain, and large waves of immigration of both people and capital. In addition, the Jacksonian era of presidential politics had been rung in with Andrew Jackson's victory in the 1828 election on a platform of "reform." What the Jacksonians meant by reform was not always clear, but references were made to Jeffersonian first principles and an attack on a perceived Federalist revival, motivated in part by the "corrupt bargain" of the previous administration (Wilentz, 2006). In economic matters, it meant a significant shift in the role played by federal and state government in the market. Not only did Jackson famously remove federal deposits from the Second Bank of the United States and revoke its charter, but he successfully extinguished the federal debt with revenue from land sales (rather than tariffs which had been the primary source of revenue up until that point), which were eventually demanded in specie. The period also marked what (McCormick, 1973) dubbed the "second party system," composed of Whigs and Democrats whose differences often revolved around the economic issues of the day.

The 1830s opened with rapid growth in GDP per capita which peaked around 1836. The well-known panic in the spring of 1837 can be seen

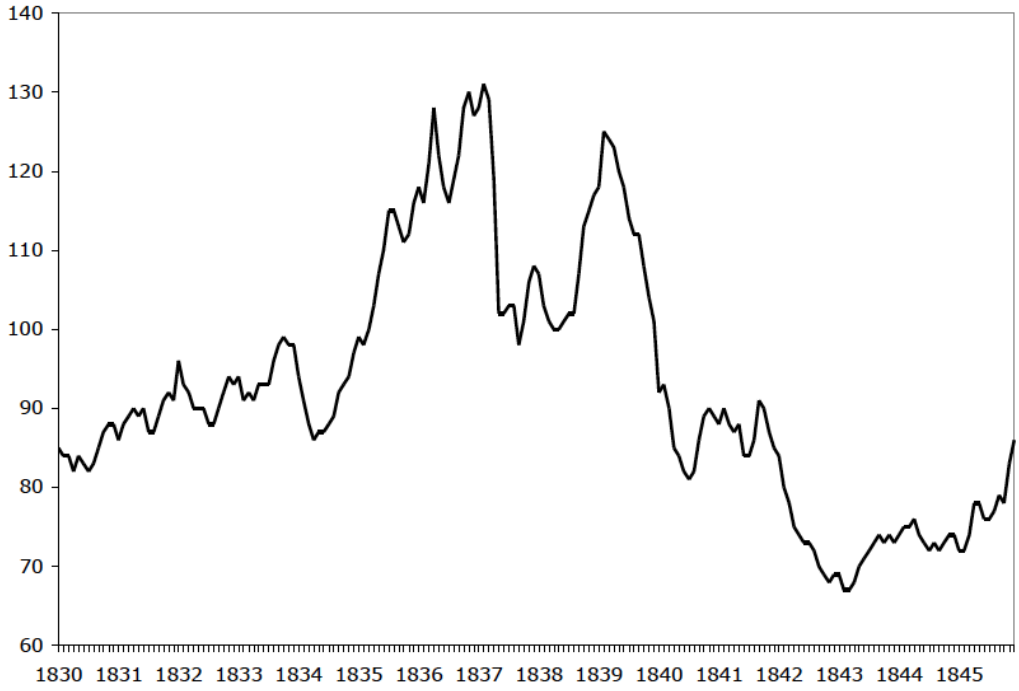
in the various macroeconomic indicators of Table 4.1, though all do not agree on whether 1837 was characterized by actual declines in output. By 1839, most series suggest a recovery, only to collapse once again. Though all of the series surveyed here suggest a decline in output in 1840, a major question in the literature is the extent to which the crisis was characterized by deflation or full depression, an issue to be dealt with below. A recovery from both declines seems to only come by 1844-5.

Table 4.1: Various Aggregate Indicators: 1830-1845

	GDP Per Capita Estimates					
	Millennial Edition	Gallman's Slave Economy Concept	Johnston and Williamson Series	Berry Series	Real Net Income from Abroad	Index of Industrial Production
Year	Millions of 1996 $	Millions of 1996 $	Millions of 1996 $	Millions of 1929 $	Millions of 1996 $	1849-1850=100
1830	1503	1751	1574	160	-76	23.801
1831	1595	1851	1597	163	-79	28.085
1832	1653	1918	1653	167	-88	31.533
1833	1711	1983	1725	176	-98	35.148
1834	1629	1884	1793	167	-113	33.579
1835	1691	1956	1716	182	-130	37.573
1836	1716	1983	1662	194	-134	40.249
1837	1662	1916	1754	185	-141	39.679
1838	1647	1898	1720	185	-181	40.697
1839	1727	1990	1825	201	-193	46.056
1840	1642	1893	1764	183	-162	43.881
1841	1608	1856	1772	200	-129	46.349
1842	1594	1839	1710	192	-131	47.656
1843	1619	1868	1668	193	-129	53.103
1844	1707	1970	1864	201	-138	59.452
1845	1734	2000	1882	209	-150	65.358

Source: Historical Statistics of the United States, Table Ca9, Ca15-19.

Thus the period has often been described as "double-headed" in terms of a variety of macroeconomic data. Indeed, price data reflect a similar pattern to GDP, if more severe in fluctuation. Figure 4.1 shows the monthly evolution of prices between 1830 and 1845 using Smith and Cole's (1935) commodity price index. After something of a deflation in 1834 (associated with high discount rates to be discussed below), the price index reflects a significant inflationary boom. Peaking in February of 1837, prices remain low until late in 1838, reaching a second peak in early 1839. The subsequent deflation was prolonged and severe. The trend did not reverse until 1843. Whether or not the deflation after 1837 and the one after 1839 share the same causes has been a matter of much debate.



Source: Smith and Cole (1935)

Figure 4.1: Monthly Wholesale Commodity Prices: 1830-1845 (1834-42=100)

An important factor in the fortunes of the antebellum U.S., was the Atlantic trade. During the 1830s, as the economy grew rapidly, a substantial trade deficit opened. Though export earnings grew rapidly, imports grew more so. In addition, it should be noted that after each peak, both exports and imports declined, but it is clear that changes imports brought the current account into balance in after crisis. As J. G. Williamson (1964) notes, throughout the 19th century, exports exhibit much milder fluctuations than imports, and this seems particularly true of the 1830s and 1840s. Services (primarily shipping), which were always positive, were only large enough to cover the trade balance when a crisis had dramatically eased the trade deficit. In addition, they were offset by growing debt service payments which peaked in 1839 and slowly subsided thereafter. As can be seen from Table 4.2, it was a decline in imports that provided the primary adjustment mechanism in the restoration of trade balance after 1837.

The obvious corollary of the deficit in current account was capital inflows, primarily from Britain. In J. G. Williamson (1964) classic study of the U.S. balance of payments, he suggests that short-term capital movements did not simply passively reflect trade needs, but were indeed a stimulus to development. This is to some degree evidenced by the large fluctuations of capital movement relative to imports. The relationship between capital inflows and imports is clearly positive, though this is consistent with the hypothesis that capital imports generate domestic growth which in turn lead to increasing imports of consumption goods. While a large portion of capital came in the form of loans (and later direct investments) to the Second Bank of the United States, short-term commercial credit played an extremely significant role. This mercantile credit came primarily through eight banking houses, among them the Baring Brothers, Brown

Table 4.2: Components of the U.S. Balance of Payments: 1830-1845

Year	Goods Exports	Goods Imports	Net Balance	Net Shipping	Balance on Good and Services	Net Interest and Dividends	Transfers	Current Account Balance	Foreign Assets in the U.S.
1830	74	-71	3	8	11	-5	2	8	-8
1831	82	-103	-21	10	-11	-4	1	-14	14
1832	88	-103	-15	8	-7	-5	5	-7	7
1833	90	-110	-20	6	-14	-5	5	-14	14
1834	105	-129	-24	6	-18	-6	6	-18	19
1835	122	-153	-31	4	-27	-7	3	-30	30
1836	129	-194	-65	5	-60	-9	10	-58	59
1837	118	-144	-26	7	-19	-9	7	-21	22
1838	109	-116	-7	10	3	-10	3	-4	3
1839	121	-165	-44	4	-40	-14	4	-49	49
1840	133	-109	24	15	39	-12	4	30	-31
1841	122	-130	-8	4	-4	-8	4	-8	8
1842	105	-102	3	5	8	-8	6	7	-6
1843	85	-66	19	7	26	-7	2	22	-22
1844	112	-111	1	6	7	-7	4	...	-4
1845	115	-120	-5	11	6	-9	6	4	-4

Source: Historical Statistics of the United States, Table Ee1-21

Brothers, Rothschilds, and the three "Ws" - Wiggins & Co., Wilde & Co., and Wilson & Co. who had agents in the United States. By 1836, it was estimated that roughly 20 million pounds had been extended on commercial account (Davis & Cull, 1994). These merchant houses financed both imports and exports. As Wilkins (2004, p. 60) notes, "the line between importer, exporter and merchant banker often became invisible." Foreign capital was also directed to some extent to private banks, mainly in New York. Notably, private investments were minor compared to the dominance of government debts.

Though the federal government had steadily reduced outstanding debt since the Revolution, state governments began to raise their borrowing. Not only did state borrowing rise, but by 1838, it had reached $172 million, which was a greater sum than the federal government had ever owed in its short history. The distribution of this borrowing among states is presented in Table 4.3. Roughly $65 million of this was foreign owned, which again was a much greater sum than the federal government had ever owed abroad (Wilkins, 2004). This money was used by states to fund banks as well as canal and railroad companies in return for stocks or bonds in these entities. Bonds issued by the states were purchased by banks or merchants, moving then to Europe to finance trade debts. Bonds were often made payable in sterling, thus subjecting the states to a substantial exchange rate risk.[2] In general, then, it could be said that state governments were the primary conduit through which international capital flowed.

After the Civil War, foreign capital seemed to be far less concentrated in portfolio holdings of public sector debt with the rise of direct investment in railroad securities. However, we should also distinguish between the

[2]McGrane (1935) has a complete discussion of the methods by which the state debts were issued and marketed.

Table 4.3: State Borrowing: 1820-1841
(in thousands of $)

State	Amount Borrowed					Outstanding Debt, 1841
	1820-25	1825-30	1830-35	1835-38	Total	
Alabama	100	...	2,200	8,500	10,000	15,400
Arkansas	...	...	...	3,000	3,000	2,676
Florida	...	...	1,500	...	...	4,000
Georgia	...	...	...	...	...	1,310
Illinois	...	...	600	11,000	11,600	13,527
Indiana	...	...	1,890	10,000	11,890	12,751
Kentucky	...	...	...	7,369	7,369	3,085
Louisiana	1,800	...	7,335	14,000	23,135	23,985
Maine	...	...	555	...	555	1,735
Maryland	58	577	4,210	6,648	11,493	15,215
Massachusetts	...	...	...	4,290	4,290	5,424
Michigan	...	...	...	5,340	5,340	5,611
Mississippi	...	...	2,000	5,000	7,000	7,000
Missouri	...	...	...	2,500	2,500	842
New York	6,873	1,624	2,205	12,229	22,931	21,797
Ohio	...	4,400	1,701	...	6,101	10,924
Pennsylvania	1,680	6,300	16,130	3,167	27,277	36,336
South Carolina	1,250	310	...	4,000	5,560	3,691
Tennessee	...	...	500	6,648	7,148	3,398
Virginia	1,030	469	686	4,133	6,318	4,037
Wisconsin	...	...	...	...	...	200
Total	12,791	13,680	41,513	107,824	174,307	192,945

Source: Ratchford (1966), p. 79.

intention of capital inflows in these two periods. During the 1830s and early 1840s, British money was primarily directed toward the expansion and transportation of cotton production. The 1840s and 1850s witnessed money directed toward the expansion of Western grain production, coinciding with a shortage of crops in Britain. After the Civil War, British money seemed to be directed to railroad securities, but these very obviously had more to do with domestic commerce than the bringing of primary commodities to the international market D. North (1961).

Table 4.4 presents the uses to which state debt was directed. Though the aggregates suggest that canal investment was the largest destination for funds, these mask regional differences. In the South, the vast majority of state debts were used to fund land banks or American bills, both of which served to expand cotton production for European consumption (J. G. Williamson, 1964). The vast majority of this capital tended to be on relatively short terms.

Early in 1837, trade and domestic production was depressed, as mentioned earlier. At the same time, foreign capital also became scarce, while the Bank of England increased its discount rate and refused to discount securities relating to U.S. trade. The three "Ws" suspended payments, and the Rothschild agents failed. Additionally, the Bank of the United States

Table 4.4: The Uses of Outstanding State Debt in 1838
(in thousands of $)

State	Banking	Canals	Railroads	Turnpikes	Miscellaneous	Total
Alabama	7,800	...	3,000	...	...	10,800
Arkansas	3,000	...	...	...	...	3,000
Florida	1,500	...	...	...	...	1,500
Illinois	3,000	900	7,400	...	300	11,600
Indiana	1,390	6,750	2,600	...	...	11,890
Kentucky	2,000	2,619	350	...	...	7,369
Louisiana	22,950	50	500	...	235	23,735
Maine	...	...	...	...	555	555
Maryland	...	5,700	5,500	...	293	11,493
Massachusetts	...	...	4,290	...	...	4,290
Michigan	...	2,500	2,620	...	220	5,340
Mississippi	7,000	...	...	...	...	7,000
Missouri	2,500	...	...	...	...	2,500
New York	...	13,317	3,788	...	1,158	18,262
Ohio	...	6,101	...	...	...	6,101
Pennsylvania	...	16,580	4,964	2,596	3,167	27,307
South Carolina	...	1,550	2,000	...	2,204	5,754
Tennessee	3,000	300	3,730	118	...	7,148
Virginia	...	3,895	2,129	355	343	6,662
Total	54,140	60,202	42,871	6,619	8,475	172,306

Source: Ratchford (1966), p.88.

(which had now become rechartered in Pennsylvania after Jackson's veto) suspended specie payments. However, by 1838, there was enough confidence for states to issue new bonds. The Bank of the United States had by this time resumed specie payments and was still well regarded in London. American securities then began to flood London, and fears began to rise among a minority that the investments had taken on a speculative character. Trouble began as the Bank of the United States once again suspended specie payments, and other banks followed. Confidence seemed to be shaken in U.S. state securities by October of 1839 (Wallis, 2001). The debts of the states went unsold. In November of 1840, a shipment of New York state bonds arrived in London to be exchanged for railroad iron or cash. The Ironmasters, however, refused to deal in U.S. bonds or stocks. Though the bonds were eventually sold, they received payment significantly below par (Wilkins, 2004). London discount rates rose once more. Eventually, the Bank of the United states failed, and since many states had depended on the bank for loans to meet interest payments, eight states and one territory stopped interest payments.

Internally, the influence of the Second Bank of the United States on domestic exchanges should not be underestimated. As Knodell (1998) has emphasized, the national bank, while it still held its charter, provided an interbranch clearing system that smoothed domestic mercantile transactions. Under Nicholas Biddle's auspices, the branches replaced local promissory notes with domestic bills of exchange. Merchants could draw bills of exchange on correspondents in other cities. These in turn could be discounted at the local Bank of the United States branch, for which the merchant would receive bank notes. The Bank of the United States, then, could ship bills of exchange between branches, crediting or debiting

the account of one branch at another. The economies of scale related to the clearing of mercantile (and other) debts lowered the average level of internal exchange rates (Knodell, 1998). As a result, Second Bank branch drafts were often substituted for gold as the reserve asset of other banks. Though bills of exchange remained the central method of interregional payments settlement, the demise of the Second Bank of the United States did seem to be associated with a rise in level and fluctuation of domestic exchanges, as they became decentralized.

The Source of Monetary Disturbances

The debates over the causes of the crisis in both 1837 and 1839 have focused primarily on whether the origins of the crises were domestic or foreign. Prior to Temin (1969) seminal book, a general consensus had emerged that Jacksonian policies were directly responsible. In part, this was accompanied by a rethinking of Jacksonian politics more generally by historians (Wilentz, 2006). Jacksonian banking policies were thus seen as essentially disastrous, and more broadly, the picture of Jacksonians as defenders of workers and small farmers began to be revised in favor of a more dismal picture of Jacksonians as power hungry and entrepreneurial.[3] Even those who thought well of Jackson's presidency blamed his banking policies which represented good intentions, "thwarted by the speculative propensities of the American people" (Temin, 1969, p. 19). Thus, whether one placed the emphasis on policy or on the speculative nature of banks, the causes were considered primarily domestic.

As Temin points out, the prior consensus among historians was quite

[3]Several Marxist historians were always suspicious of Jackson's populist leanings. Thus, H. Frankel (1946) describes Jackson's coalition as "the rule of an exploiting class concealed behind the appeal to the common man."

striking. From McGrane (1924) to Schlesinger (1971) to Hammond (1991), all agreed on the disastrous consequences of Jackson's policy. Focusing on the bank war, they argued that the Bank of the United States had provided a check against speculative activity. By collecting large quantities of bank notes from state chartered banks, the Second Bank of the United States was able to provide the threat of mass redemption.[4] In addition, during times of stress, the Second Bank could refrain from redeeming notes so as to provide liquidity.[5] Jackson's well-known veto of the bank's charter then allowed state banks to expand their note issue. Even prior to his veto, Jackson had removed federal deposits from the Second Bank and placed them with the "pet" banks. Without federal deposits, the Second Bank lost much of its regulatory ability. It was of course during this period that the number of banks chartered in the states grew.

According to the traditional explanation (which Rockoff (1971) dubbed the "soundness" school), the result of an expansion of notes without an appropriate backing of gold was inflation. Without the regulation of the Second Bank, and flush with government deposits (which banks treated as reserves), banks expanded loans and note issue often to finance speculative land purchases from the government. Of course, such speculation and expansion of the money supply could not go on forever. For these historians, it was the August 1836 order by Jackson, known as the "Specie Circular," requiring federal land sales to be made in gold that pricked the bubble. The intention of the Circular was to reduce note issue and speculation. In combination with the movement of federal deposits to pet banks,

[4]It should be noted that prior to 1837, there were no consistent regulations on banks reserves Hammond (1991).

[5]Whether or not the Second Bank actually acted in a countercyclical manner is a matter of debate. It did have some incentive as a private bank to raise rates to protect itself in times of distress.

however, the result was to draw gold Westward and increase the public's demand. In particular, gold left New York and moved to rural areas where land sales were large Hammond (1991). The money supply thus contracted and prices fell as banks suspended note redemption.

Temin's (1969) revisionist story drew attention away from the Bank War as well as the specie circular and distribution of surplus funds, and placed responsibility with external events. Using the basic monetary decomposition as pioneered by M. Friedman and Schwartz (1971), Temin challenged the notion that banks expanded credit without reason, enabled either by the transfer of government deposits or lack of regulation provided by the Second Bank. Instead, Temin argued that the increase in the money supply was "justified."

Temin finds that there was indeed growth in the specie stock that other historians had not detected. This was because the estimates for exchange rates at the time suggest that though the pound was perhaps undervalued, it had not reached the specie export point. Temin argues that instead of looking to Europe, the source of the specie inflow could be found in the form of silver imports from Mexico. Perhaps even more importantly, as the silver imports were not large during the mid-1830s, was the decrease in silver exports.

Temin suggests that there was a significant decline in the export of silver to China. That is, whereas before the mid-1830s silver imported from Mexico was exported, it now remained within national borders. Persistent trade deficits with China led British traders to import opium to China, a potential solution to their trade problems due to its addictive nature. By the 1830s, China's trade balance had been reversed. Most notably, however, was the abandonment of silver demand and the adoption of bills on

London to finance the opium trade. No longer requiring silver, American merchants could use bills on London to purchase opium and then buy Chinese goods with the opium. This strongly reduced the movement of silver between the U.S., China and Britain, resulting in the accumulation of Mexican silver deposits in the U.S. Temin's observed reserve ratios (Table 4.5) demonstrate that even after the removal of the Second Bank's check on state banks and the movement of federal deposits, the reserve ratios of banks remained "remarkably constant." In addition, at the regional level, western states who were supposed to be at the heart of the speculation did not have the lowest reserve ratios. Thus, Temin has constructed a price-specie-flow mechanism, but one that essentially operated by accident.

Table 4.5: Temin's Money Supply Decomposition: 1830-1845

	Money	Specie	Reserve Ratio	Money Held as Specie
Year	Millions of $	Millions of $	Percent	Percent
1830	114	32	23	6
1831	155	30	15	5
1832	150	31	16	5
1833	168	41	18	8
1834	172	51	27	4
1835	246	65	18	10
1836	276	73	16	13
1837	232	88	20	23
1838	240	87	23	18
1839	215	83	20	23
1840	186	80	25	24
1841	174	80	23	30
1842	158	90	33	35
1843	194	100	35	26
1844	214	96	27	24
1845	241	97	23	23

Source: Temin (1969, pp. 71, 159).

The trade deficit and importation of British capital that emerged were, according to Temin, the result of price changes caused by the increase in silver. Import demand was then the result of changes in relative prices that caused a substitution of U.S. produced goods for British goods. Temin does not believe this could have been the result of changes in national income. The eventual removal of British capital, then, produced a commercial crisis that was primarily the result of falling cotton prices upon which a large portion of the credit structure was built. Temin goes on to tell a similar story about the crisis of 1839, which was caused in part by a bumper cotton crop and British credit tightening. Using Gallman's estimates of GDP, he suggests that even more than the crisis of 1837, the 1839 crisis was primarily monetary and associated with a large deflation rather than output movements.

Since Temin's seminal book (and associated articles), the tides have once again turned against Jackson. Rousseau (2002) has argued that the supplemental interbank transfers that were designed to prepare for the official distribution of the federal surplus and the Specie Circular should bear the blame. The consequence of these two federal policies was to significantly reallocate specie between the states. That is, though the official distribution of the surplus was small (prompting Temin to discount it), there was a series of supplemental transfers prior to the distribution which were larger and did involve transfers of money (which Rousseau argues was in the form of specie though it is not known for sure) westward. In other words, rather than an external balance of payments crisis, Rousseau argues that there was a significant internal payments crisis between the states making eastern banks particularly vulnerable to British specie calls. In addition, the Specie Circular produced a diversion of specie from commercial uses,

to be "locked up" in pet banks.

Knodell (2006) has also placed an increased blame on Jackson. She argues that the Friedman-Schwartz decomposition used by Temin does not capture the changes in bank balance sheets in the antebellum period.[6] That is, antebellum banks relied less on deposits and more on equity as a source of funds. Knodell identifies three sources of the increase in bank credit: changes in bank reserves, changes in reserve ratios, and an increase in bank equity. While Temin focuses on the first two, Knodell suggests the third was more relevant to the 1830s and 1840s. With this decomposition, she finds that these three determinants explain 88% of bank loan growth in 1830-36, of which 56% could be attributed to equity growth. It is notable that a portion of this equity was in the form of loans to bank shareholders who paid in on an installment basis. The shares of other banks were occasionally used as collateral for these loans. Thus, though banks maintained reserve ratios, they collectively increased their leverage. As Knodell argues, "because equity accounted for about half their liabilities [state banks] were as much mutual funds, funding asset acquisition with equity shares, as they were banks, funding asset acquisition with reserve-backed notes and deposits" (Knodell, 2006, p. 570). Additionally, Knodell (1998) has demonstrated that the demise of the Second Bank generated a high degree of variability in inland banknote exchange rates.

Wallis (2001) has also brought Temin's external causes under question. In the crisis of 1839, Wallis argues that state debts were central. The

[6]Tobin (1965) argued that the restrictive nature of the Friedman-Schwartz decomposition was not particularly appropriate for the modern period either. By limiting themselves to currency and commercial bank deposits and ignoring other kinds of claims on financial institutions the causal role to which Friedman and Schwartz attribute to their money stock deserves some skepticism.

crisis was then focused in the Southern and Western states (unlike the panic of 1837) as they were the ones engaged in the heaviest borrowing. The land boom, then, was financed by credit expansion and encouraged state borrowing. When the banks who financed the expansion were unable to meet obligations to states (beginning with the Morris bank's obligation to Indiana), the states defaulted and halted construction projects. That is, states were financing their interest payments with proceeds from loans, and when this money dried up, they were unable to meet their obligations. Wallis thus argues that the crisis was primarily domestic and not related to international payments.

A common element in the explanations of the inflation and subsequent crisis of the 1830s and 1840s has been that they all involve monetary causes. As Rockoff (1971) notes, "nearly all of the participants in the debate have used a quantity theory framework for analyzing the Jacksonian inflation (and subsequent deflation)... The debate has centered on which particular components of the money stock have changed and for what reasons" (p. 450). A potential problem with these explanations may concern the appropriate definition of the money stock. The definition of what should and should not be considered money has a very long history, one which would be difficult to summarize here. Clearly, for Temin and most other commentators on the antebellum economy, the money supply, following the Friedman-Schwartz definition, consists of basic liabilities of banks: banknotes and deposits. These rest upon a base of specie reserves, and as Knodell (2006) points out for the antebellum period, bank equity.

It is interesting to note, however, that, as the U.S. crisis wound down in the 1840s, a debate on precisely this question raged across the Atlantic. Known as the Currency-Banking School debates, they arose after a lasting

deflation (related in part to the U.S. crisis as described below). On one side, the Currency School argued that the key to stability was the control of banknotes such that paper money would passively substitute for metallic currency. For them, the money supply could be simply defined as the banknotes and coin of the realm, and was solely responsible for changes in the price level.

The Banking School argued, much like the antibullionists before them, that an excess of notes could not be inflationary. Instead of relying on the real bills doctrine, they made use of Thomas Tooke's principle of reflux which argued that excess notes would find themselves redeemed, and thus would not affect prices. Thus, Tooke argued, "... prices of commodities do not depend upon the quantity indicated by the amount of bank notes, nor upon the amount of the whole circulating medium; but that, on the contrary, the amount of circulating medium is the consequence of prices" (Tooke, 1959, p.123). In this view, money should include not only banknotes and coin, but also bank deposits, bills of exchange, exchequer bills and other forms of credit (Smith, 2001). Along these lines, Tooke distinguished between two branches of circulation. The first was between dealers and consumers, and the second between dealers and dealers. The latter were undertaken primarily in bank loans and other forms of credit that could be settled with bills of exchange and checks, and involved transactions associated with production and wholesale distribution of commodities. For Tooke, the point was to demonstrate that much of British transactions were undertaken by the use of checks and bills of exchange without the need for banknotes. Since bills of exchange and credit extended by dealers to dealers varied with the level of activity, the "circulating medium" could not be considered the cause of price movements

(Smith, 2001).

A similar criticism could then be made of the existing literature of the Jacksonian crisis. The role of bills of exchange and other mercantile credit between dealers should not be underestimated. As described earlier, the main form of interbank settlement while the Second Bank was still federally chartered was through Second Bank drafts and the exchange of bills. Indeed, the use of bills of exchange, and credit innovation in general, had been a fact of life since the experience of colonial hard money scarcity (Sylla, 1982). In that case, the requirements of colonial governments produced monetary innovation to satisfy their need. Thus, not only were bills of exchange endogenous to demand, the general form of credit was as well. By the 19th century, documentary bills, sight drafts, and banker's acceptances were all in use. As a result, throughout the colonial and antebellum periods, the growth of specie and prices were often at odds. It is not simply that new credit creation could meet the needs of a growing economy, but an inflow of gold need not increase the supply of money. Without creditworthy borrowers, banks could simply hoard the gold without increasing note circulation, thus reducing its velocity. Alternatively, excess specie could always be used to accumulate British bills, which were always in demand due to their use in international trade.

We should note as well that the specie constraints on the growth of the money stock globally could be criticized as well. As long as bills on London served as useful reserve due to the position of London in international capital markets, British long-term outflows can be positive without any movements of gold (Serrano, 2003). In other words, the British balance sheet can expand indefinitely as long as its long-term assets are balanced by short-term liabilities, which will be ensured as long as bills of exchange

are accumulated by other countries like the U.S. The implication of this is that there will be a demand for bills of exchange independent of trade flows. Thus, the exchange rate between the U.S. and Britain will not necessarily be the passive result of trade, but of changes in interest rates, particularly changes in the British discount rate to be described below.

We have considerable reason to believe that prices in the antebellum U.S. were not the simple result of changes in the money supply due to either excessive note issue or the accumulation of Mexican silver. The stock of specie had risen before without consequent changes in prices, and significant price inflation had occurred without increases in the stock of specie. Additionally, the explanation of prices as a result of excess money balances should be associated with low interest rates in periods of inflation and high interest rates in periods of low inflation or deflation. The antebellum period, however, as can be seen in the data presented above, conforms to the well known "Gibson's paradox" in which interest rates and prices seem to move in step.

A final objection, to be detailed in the next section, concerns the movement of output and employment during the period 1837-1844. In a sense, this reflects a second debate, in addition to the one regarding internal vs. external causes, over whether the deflations of the antebellum period (particularly the long deflation between 1839-1843) were in fact associated with downturns in aggregate economic activity.

A long tradition among certain labor historians has maintained that the crisis following 1837 and including the early 1840s represented a period of significant unemployment and declines in output that provided an impetus to union organizing and labor consciousness.[7] An alternative view,

[7]Commons (1966) is perhaps the first detailed treatment of long run labor history in the U.S.. More modern proponents of this view include Wilentz (1984) and Laurie (1980).

held by most of the contributors summarized above, suggests that unemployment and declines in output tended to be small and at best temporary. In their view, the price mechanism, unfettered by modern labor contracts and monopoly pricing operated to eliminate labor surpluses rather efficiently. The argument, as summarized by Goldin and Margo (1992) thus hinges on whether real wages were flexible or sticky. If real wages showed a sustained increase during periods of deflation, unemployment should be expected, while if real wages fell we should expect the labor market to clear. Their econometric work on Margo and Villaflor's (1987) wage data suggests that real wage shocks were transitory (the time series, in other words, do not exhibit unit roots) and thus long run unemployment should not be expected. In the short-run, however, there was some degree of nominal wage lag that might account for temporary unemployment. Thus, price decreases, caused primarily by monetary phenomenon in the view of Temin and the authors summarized above, could be associated with temporary unemployment. [8]

In the antebellum period, we may note that the rising debt service costs

[8]The analysis of the relationship between output and price flexibility hinges on the labor market. There is, of course, a tradition in economic theory emphasizing a variety of stabilizing consequences of wage and price flexibility on output. Wicksell (1962), for instance, argued that deflation may put pressure on the monetary rate of interest, potentially causing it to fall to the natural rate. Pigou (1943) famously argued that a "real balance effect" may imply that deflation increases the real value of wealth and thus consumption. Modigliani (1944) suggested that deflation would be associated with declining money demand and thus a falling rate of interest and a subsequent rise in investment. Thus, even if nominal wages were inflexible, other stabilizing features of deflation will counter this effect.

An alternative tradition, associated with Keynes (1997) and the modern post-Keynesians, suggests that wage and price flexibility may actually make output movements more severe. This tradition has focused on the redistributive effects on aggregate demand that may result from movements in wages, prices, and the interest rate. We may add to this list the distributive effects of exchange rate movements associated with changes in these variables, in particular the exchange rate, as emphasized by structuralist authors (Taylor, 1983). Deflation may thus lead to changes in distribution between debtors and creditors as well as between workers and firms that affect aggregate demand and thus output in indeterminate ways.

did indeed increase in the deflation, and as a result, state governments curtailed their expenditures severely and eventually defaulted. Households and firms additionally found themselves unable to service their debts. Indeed, the Texas Homestead Act of 1839, which prohibited the seizure of homes by creditors, is a testament to the rising burden of debtors. Similarly, the Federal Bankruptcy Act of 1841 (short lived as it was) was intended to relieve debtors of some of their burden. Given the state of affairs, Philip Hone merchant (and mayor) of New York wondered in 1839, "how the poor man manages to get a dinner for his family."[9] Hone went on to complain that in 1840, his three grown sons could not find work.

Though the consequences of deflation on debt service will be dealt with in the next section, we may additionally note that price flexibility was not only supposed to clear labor and domestic output markets, but to resolve the imbalance on current account. Temin (1969) and others have suggested that domestic prices were the primary adjustment mechanism leading to changes in exchange rates and net exports without significant changes in income, particularly in 1839.[10] The rising prices of 1836 did not produce a strong adjustment in the balance of payments because the inflow of British capital temporarily held these forces off. However, given the elasticity estimates presented in Chapter 3, imports were likely highly elastic with respect to income, but less so with respect to prices. This is to some extent confirmed by the coincidence of long run cycles of income and imports before the Civil War as outlined by J. G. Williamson (1964) and the long cycles identified in Chapter 3. The high income elasticity was due to the nature of imports, which consisted primarily of textiles, manufactured

[9] As quoted in Rezneck (1935).

[10] Temin's (1976) view that the money supply, perfectly vertical with respect to the interest rate, is the result of movements in gold is somewhat surprising given his later view of the Great Depression.

foodstuffs, and to some degree iron for railway building. Goods, in other words, that could not easily be substituted for in the event of domestic price changes. Imports did the bulk of the work in correcting external balance at the time, and it is unlikely for these kind of sharp adjustments to be caused by price movements.

The Adjustment to Balance of Payments Disequilibrium

A longer run view suggests that the crisis of the late 1830s and early 1840s is not particularly unique in the history of specie standards. In fact, periods of disinflation globally, accompanied by financial crises in peripheral economies, were common throughout the 19th century. The close of the Napoleonic Wars changed the role played by the City of London in the world economy drastically. The financing requirements of the British, whose ability to raise debt likely played a decisive factor in the wars, led to London's displacement of Amsterdam as the center of international trade and finance. A great deal of the financing of international trade began to be conducted in bills of exchange denominated in pounds, and long-term loans (many to sovereign governments) also became denominated in pounds (Ferguson, 2001). In addition, the wars severely strained the close link between the Spanish and Portuguese and their colonies in the New World. As London grew in importance, it took advantage of the lack of Spanish and Portuguese presence to begin to extend its loans and financial resources to finance the early years of independence for many Latin American economies. Much of the capital went to finance the production of raw materials. The lending boom ended with deflation, depression, and eventual default (Dawson, 1990). It was a pattern to be repeated for many

years afterward. Any financial boom is accompanied by varying degrees of fraud, speculation, and increasing instability, whose details depend on particular circumstances. In the Jacksonian period, it seems clear that domestic financial fragility was encouraged by federal policy. However, a longer view of these crises reveals certain structural features at work. In particular, the asymmetric adjustment mechanism of center and periphery during the 19th century remained relatively constant, even though the details of financial instruments changed. While the British could adjust through capital flows managed by monetary policy, much of the world, including the antebellum U.S., had to adjust to imbalances on international payments through changes in the level of activity.

As emphasized by Bloomfield (1963), Nurkse (1944) and others, capital flows even during the classical gold standard could be considered destabilizing in much of the world. For Great Britain, however, the adjustment to external imbalances came, at least in the short-run, primarily through adjustments to the rate of interest by the Bank of England. For much of the 19th century, Britain ran trade deficits with the rest of the world while it was simultaneously a net lender of long-term capital. This situation was possible, without gold movements, because of the ability of London to attract short-term capital inflows, and because of income from its international investments. Thus, it did not normally run current account deficits, while providing effective demand to the rest of the world.[11] A curtailment of British lending, however, would have to be met in the receiving countries by (sometimes large) changes in the level of output. For the British, however, the reduction in long-term lending and the increase in short-term

[11]As it began to be subject to greater competition in manufactured goods from the U.S. and Germany, England increasingly relied on trade within the empire to prevent a deterioration of the current account. See De Cecco (1974).

capital inflows associated with a rise in the Bank of England's discount rate did much of the work of equilibrating foreign payments.

During the period under consideration, the British balance of payments did indeed show a consistent trade deficit as seen in Table 4.6. As mentioned above, however, other items kept the current account essentially in surplus. The gap in trade in services was most often more than covered by net interest and dividend income. As Ford (1958) points out, the interest and dividend income was the result of long-term overseas lending. Thus, British foreign lending created the current account surpluses required to cover it. Additionally, short-term capital inflows meant that the British acted as something of a banker to the world, borrowing short and lending long.

The ability to attract short-term credit was a direct result of Britain's place in world trade and finance. The British were primary buyers of the main U.S. export, cotton. Bills on London thus emerged through the Southern cotton trade and were accumulated by banks. In particular, while it maintained its federal charter, the Second Bank was the primary dealer in foreign bills of exchange (Knodell, 2006). We may note as well that specie movements were quite small throughout the 19th century, with short-term bills of exchange clearly substituting. Bills on London were particularly attractive since the majority of imports were of British origin, and as mentioned earlier, trade with other nations (like China) could be conducted in bills on London.

The British, throughout the century, were thus increasingly able to establish the pound as a global currency. This meant that they could most always settle their external obligations in sterling. As a result, British debt could be considered "zero risk" and indeed, Britain spent most of the 19th

Table 4.6: British Balance of Payments: 1831-1845

(in millions of pounds)

	Balance of Visible Trade		Balance of Business Services			Balance of Other Items					
Year	Merchandise	Bullion and Specie	Profits on Foreign Trade and Services	Insurance commis-sion, etc.	Net Earnings of Shipping	Emigrant Funds	Unrecorded	Net Trade and Ser-vices	Net Interest and Divi-dends	Current Ac-count Balance	Net Credit Abroad
1830	-12.0	-3.5	5.0	2.5	9.4	-0.9	-2.3	-1.8	-3.8	2.0	110.5
1831	-18.1	3.5	5.3	2.6	10.5	-1.2	-2.2	0.4	3.9	4.3	114.8
1832	-8.7	-1.2	4.8	2.4	8.8	-1.5	-2.2	2.4	4.6	7.0	121.8
1833	-12.3	-2.4	5.3	2.6	9.7	-0.9	-2.4	-0.4	4.9	4.5	126.3
1834	-15.1	2.3	5.7	2.9	10.3	-1.1	-2.5	2.5	5.7	8.2	134.5
1835	-12.1	0.8	6.3	3.1	11.8	-0.7	-2.8	6.4	6.1	12.5	147.0
1836	-22.3	1.5	7.4	3.7	12.6	-1.1	-3.2	-1.4	6.6	5.2	152.2
1837	-19.0	-2.0	6.1	3.0	11.5	-1.1	-2.5	-4.0	6.1	2.1	154.3
1838	-20.8	0.0	7.0	3.5	12.1	-0.5	-3.0	-1.7	6.2	4.5	158.8
1839	-29.4	4.4	7.7	3.9	15.1	-0.9	-3.1	-2.3	5.6	3.3	162.1
1840	-29.8	0.9	7.6	3.8	14.3	-1.4	-3.1	-7.7	5.7	-2.0	160.1
1841	-22.4	-1.0	7.3	3.6	14.5	-1.8	-3.1	-2.9	5.6	2.7	162.8
1842	-20.6	-2.9	6.6	3.3	12.8	-1.9	-2.8	-5.5	6.5	1.0	163.8
1843	-10.9	-3.6	6.6	3.3	11.9	-0.9	-3.1	3.3	7.0	10.3	174.1
1844	-12.2	-3.0	7.3	3.6	12.3	-1.1	-3.5	3.4	7.8	11.2	185.3
1845	-19.0	-1.0	7.9	3.9	14.5	-1.4	-3.6	1.3	8.3	9.6	194.9

Source: Imlah (1952)

century with a debt-to-GDP of over 100%, sometimes reaching over 200% (Ferguson, 2008). British short-term interest rates, determined by the Bank of England, became the base interest rate for the global economy, and it received special privileges of external adjustment.

For the U.S., however, certain issues of external debt had to be denominated in pounds while almost all had to at least have a gold clause. It should be noted that though the federal government had been almost immediately able to issue debt in dollars on the London market after the Revolution, the individual states were not so fortunate. Often underwritten by large merchant houses, the Barings in particular, state issues of debt in London throughout the first half of the 19th century were for the most part denominated in pounds (Ratchford, 1941). Thus, they were subject to a potential exchange rate risk.

After 1830, British foreign lending to the U.S. came primarily in the form of long-term capital to states with the intention of supporting the production of raw materials (Wilkins, 2004). Thus, an additional equilibrating mechanism for the British was the increase in exports that resulted as British capital went abroad to finance a variety of infrastructure projects which required British produced industrial goods. In this sense, the increase in foreign lending can actually create an increase in the demand for foreign lending. We may add that this is not only because the loans were often used to purchase foreign capital goods, but they were required to service existing debt, and to the extent they financed domestic expenditures, they led to increasing import demand. For the U.S., then, it seems to be the case that the arrival of British capital caused an increase in domestic demand that could only be satisfied with increasing imports.

The capital export was additionally associated with good harvests and

rapid growth in the textile industry in Britain, which created an increasing demand for cotton and other primary commodities, driving their prices up.[12] The relative ease with which bills associated with U.S. trade were discounted in Britain seemed likely to contribute as well (Matthews, 1954). The price of these commodities, which formed the core export revenue for the U.S., depended in large extent to the pace of industrialization in England, and its monetary policy. In times of rapid industrialization in England, commodity prices would be high, and during times of slower growth, commodity prices would be low.

Though external debt rapidly accumulated during this period, borrowing agents, and in particular the states, were able to meet their debt service obligations. With high export prices, debt service was manageable despite rising domestic discount rates and an increasingly depreciated currency.

The rise in U.S. export (primarily cotton) prices, however, leads to increasing costs for British producers. As emphasized in the above discussion, commodity prices are the result both of demand conditions resulting from the pace of industrial output growth, financing conditions, and any climate or other natural limits on production. Industrial prices, however, were primarily determined by the cost of production, of which primary commodities are one of several components.[13] It should be noted, then, that to the extent British monetary policy affected the price of commodities, it would influence the costs of production of industrial goods and,

[12]The pattern of price inflation domestically seemed to associated most closely with the allocation of bank financed loans.

[13]Tooke (1844) suggested around this time that prices were primarily determined by the cost of production. The cost of production theory of prices of course has a long history in economics. Kalecki (1971) in particular emphasizes the distinction between the determination of primary commodity prices and industrial prices. The conditions of supply in industry are such that output can generally be expanded with constant or declining average costs.

depending on the response of the markup, their prices.[14] In general during this period, British prices were less volatile than the prices of imported primary goods. Imlah's (1950) terms of trade series, for instance, implies an import price variance 50% higher than export prices between 1830 and 1845. Of course, cotton prices specifically prove even more volatile.

Thus, as U.S. export prices rise, British terms of trade deteriorate and increasing pressure is placed on the merchandise balance. Between 1835 and 1836, the current account surplus was more than halved (Table 4.6). Though this was not associated with a specie drain, 1837 witnessed pressure on the net specie balance. When its current account was strained, or when its long-term lending was not balanced by short-term flows, the Bank of England could, with adjustments to its discount rate, attract short-term flows from around the world. Additionally, sharp changes in the discount rate would affect the financing conditions for stocks, as emphasized by Matthews (1954). As it increased its interest rates to bring in short-term capital, price of imports would collapse. Once import prices had sufficiently fallen, and short-term flows became satisfactory, interest rates (quite high in real terms in the context of the disinflation) would slowly fall.

This was indeed the policy of the Bank of England even prior to the 1844 Bank Act when monetary policy was supposed to be governed by the "Palmer rule" (Clapham, 1945). The rule required that during periods of "full currency," when Bank reserves were at a maximum and the exchanges implied a zero balance on specie movements, Bank securities should be held equal to two-thirds of the liabilities. If conditions changed such that bullion would be imported or exported, the securities of the

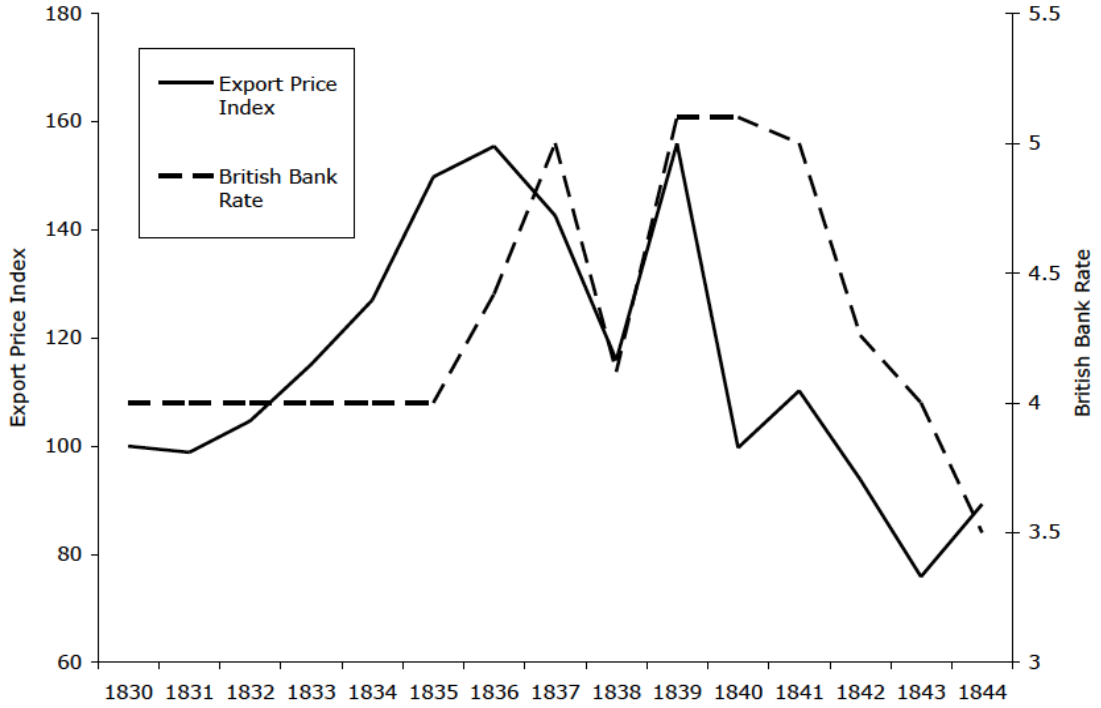
[14] Pivetti (1991) following Sraffa (1960) suggests that the rate of interest may also govern the rate of profit.

Bank were to be held constant at the level just defined (Matthews, 1954). Whether or not the Bank followed the rule closely or not is a matter of debate that is beyond the scope of this paper.[15] More important for our purpose is the general relationship between the Bank of England's discount rate and the state of the foreign exchanges. Discount rates rose when gold or claims on it began to leave, and the rate lowered in the opposite case.[16] Thus, Sayers argues that, "for almost a century before 1914 the Bank regarded itself as primarily responsible for the protection of the gold reserve.. the Bank had settled to the view that it was by the manipulation of an effective Bank Rate that the Bank could protect its reserve consistently..." (Sayers, 1976, p. 28). This concern with the foreign exchanges meant that countries who were the recipients of long-term British capital flows after Waterloo had access to foreign capital only as long as the Bank accommodated.

We can see the restoration of British terms of trade and its mechanism in Figure 4.2 and Figure 4.3. The impact of the Bank of England's discount rate on U.S. export prices is clear. As U.S. export prices mounted, the bank rate was increased to 4.5% and then to 5% in 1836 from 4% where it had been since 1827. Additionally, certain bills associated with U.S. trade were refused by the Bank (Clapham, 1945). The financing costs of commodities for British importers increased, and goods were released from bond in great quantities as stocks had been built up in 1836 (Matthews, 1954). The slowing of British industry also resulted in a decline in demand for raw cotton. It was not simply cotton prices that collapsed, but a variety of assets financed through the banking system. The domestic financial

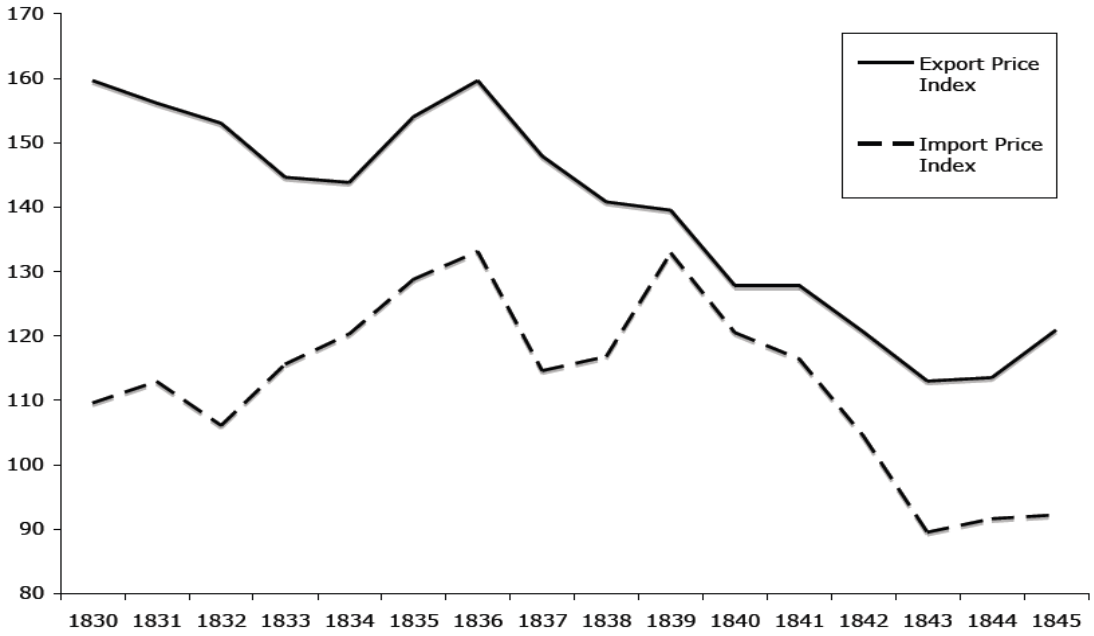
[15]Viner (1965) argued that the Bank frequently violated the rule.

[16]Interestingly, there seems to be a great deal of evidence that the supply of British domestic credit was much more elastic with respect to level of activity rather than the rate of interest (Matthews, 1954).



Source: North (1966) and Homer and Sylla (2005). The Bank rate reflects yearly averages.

Figure 4.2: U.S. Export Price Index and the British Bank Rate
(1830=100)



Source: Imlah (1950)

Figure 4.3: British Import and Export Price Indices: 1830-1844
(1880=100)

fragility emphasized by Rousseau (2002), Wallis (2001), and Knodell (2006), thus played a significant role as well, particularly in the real estate market which had been subject to speculation. Finally, the dollar became depreciated against the pound further reducing the value of U.S. export earnings.

As export revenues fell, and capital moved back to London, discount rates rose sharply in Boston and New York. Table 4.7 suggests that interest rate spreads were increasing, but this seems to have only mildly stemmed the outflow of capital. As mentioned earlier, this is the result of the asymmetric positions of the two countries in international trade and finance. The trouble, of course, is that interest rates began to rise and the exchange rate began to depreciate at precisely the time when export prices had collapsed. The effect, then, of depreciated exchange, low export prices, and high domestic and international interest rates is to severely increase the burden of debt service. The solvency of countries in this situation, as pointed out by Domar (1950), is determined by the rate of exports and the rate of interest.

From Figure 4.2 and Table 4.7, it can be seen that capital returned by 1839, the exchanges settled, and export prices improved. Additionally, the bank rate had been lowered in February of 1828 (Clapham, 1945). It is during this period that a great deal of the borrowing by U.S. states took place (Ratchford, 1941). Indeed, this in part accounts for the quick recovery as state spending proved to be countercyclical. As activity picked up, British exports improved further encouraging capital outflows and increasing commodity prices.

The final blow came as British specie holdings once again came under pressure as inflation in U.S. export prices resumed. In addition, British manufacturers' margins once again became squeezed. The Bank rate was

Table 4.7: Exchange Rates, Interest Rates, and Capital Inflow

Year	3% British Consol Yields Annual Average	British Bank Rate Annual Average	British Open-Market Discount Rate Annual Average	U.S. Commerical Paper Rates Annual Average	New England Municipal Bond Yields Annual Average	Bill of Exchange Sight Equivalent Exchange Rate $ per Pound	Net Interest and Dividends Millions of $	Foreign Assets in the U.S. Millions of $
1830	3.49	4.00	2.81	...	4.9	4.7616	-5	-8
1831	3.76	4.00	3.69	6.12	...	4.8601	-4	14
1832	3.58	4.00	3.12	6.25	5	4.8577	-5	7
1833	3.42	4.00	2.75	7.83	4.87	4.7872	-5	14
1834	3.32	4.00	3.37	14.70	4.87	4.6382	-6	19
1835	3.29	4.00	3.70	7.00	4.83	4.8498	-7	30
1836	3.35	4.42	4.25	18.00	4.96	4.8173	-9	59
1837	3.30	5.00	4.45	14.25	4.95	5.0985	-9	22
1838	3.23	4.12	3.00	9.04	5.01	4.8863	-10	3
1839	3.28	5.10	5.10	12.58	5.21	4.9845	-14	49
1840	3.35	5.10	5.00	7.75	5.07	5.0003	-12	-31
1841	3.38	5.00	4.90	6.80	4.99	4.9893	-8	8
1842	3.27	4.60	3.33	8.08	4.95	4.7972	-8	-6
1843	3.17	4.00	2.18	4.41	4.88	4.7878	-7	-22
1844	3.03	3.50	2.12	4.87	4.84	4.8595	-7	-4
1845	3.12	2.70	2.96	4.71	4.86	4.8713	-9	-4

Sources: Interest rate data from Homer and Sylla (2005), exchange rate, interest, and dividend and foreign assets data from Historical Statistics of the United States.

raised 6% until and held for several months until it was lowered to 5% where it roughly remained until 1843. A bank rate held indefinitely high was enough to provoke a prolonged deflation in global commodity prices, finally restoring the British terms of trade and profit rates by the mid-1840s.

Adjustment was not costless for the British. As Matthews (1954) notes, the years 1841-1842 were associated with significant declines in output, but this does not seem to be associated with the balance of payments. Indeed, by this time, much of the imbalance had been corrected. Thus, Matthews concludes that the principle cause was a fall in domestic investment and a poor harvest. A fall in exports to the U.S. certainly played a role, but was perhaps offset by increases in exports to Europe. Regardless, a degree of output adjustment is to be expected, even when the British dominance of international finance was at its height.

For the U.S., however, the rising burden of debt service and the decline in export receipts necessitated a large change in the level of activity in order to adjust to a lack of foreign lending. In the deflation of the early 1840s, nine states found themselves unwilling or unable to make interest payments on their debt. Most accounts of the defaults have emphasized the corrupt and speculative nature of the state expenditures. Though certainly some degree of inefficiency in investment was present, two points must be remembered. First, the financing of development projects in particular had dried up prior to their completion. Thus, the return on these investments was not realized. As Ford (1983) discusses in the Argentinian context in 1890, the slow maturing of infrastructure projects associated with the commodity trade suggests that it is perhaps best to think of the crisis as one of “development” rather than one primarily of fiscal excess.

Additionally, the dynamics of debt imply that its growth rate relative to income depends on the interest rate minus the growth rate of output (Domar, 1944). When the debt is external, one must take into account the availability of foreign exchange earnings and the exchange rate to the extent that the debt is denominated in a foreign currency. Since, as mentioned earlier, the debts of states and much of the mercantile establishment were denominated in pounds (or had gold clauses), the low price of cotton and the depreciated dollar suggest unstable debt dynamics. Thus, for the U.S., rising interest rates, falling prices, and depreciation could not resolve the balance of payments problem, and in fact, made it worse whereas for the British, these factors proved stabilizing.

Conclusion

A common feature of the current economic literature on the Jacksonian period is, as Rockoff (1971) pointed out, its commitment to monetarist explanations of the crises. Monetary forces caused rapid prices changes and produced financial distress. In addition, prices provided the main adjustment mechanism to shifts in the balance of payments. This article suggests that given the structure of the U.S. economy at the time, as well as its relations with England, it would be innapropriate to assign the stock of money a causal role. As Phelps Brown and Ozga (1955, pp.177-178) noted in regards to long run price movements since 1790, “the evidence obliges us to conclude that in the secondary secular movements of prices the quantity of money played a passive part, adapting itself to the requirements of changes in turnover which were independently initiated.” In addition, price declines could not produce balance of payments adjustment and were in fact destabilizing given the external debt commitments

and commodity trade denominated in pounds. Future work should examine the structural pattern of domestic inflation to identify the changes in domestic distribution that resulted from shifts in British monetary policy. Thus, while Jacksonian policy surely caused increasing financial fragility internally, as pointed out by Wallis (2001), Rousseau (2002), and Knodell (2006), the shift in capital flows necessitated a change in the level of activity all else equal.

The 1837-1843 crisis was not particularly unique over the 19th century in this respect. As a result of the asymmetric adjustment mechanisms, we observe recurrent long phases in the 19th century which are characterized by disinflation in central countries, and waves of macroeconomic crises in the periphery. Indeed, Suter (1992) has identified waves of sovereign defaults in the global economy since 1820. The defaults of nine U.S. states comes precisely at the peak of the first wave of sovereign defaults. Surrounding the U.S. defaults were Spanish, Portugese, Greater Colombian, Mexican, Brazilian, Greek, and Peruvian defaults.

As Ginzburg and Simonazzi (2011) emphasize, these phases seem to be associated with three things. First, there are significant swings in the monetary policy of the center. A somewhat lax policy is reversed by strong contractionary increases in interest rates. Second, commodity prices, or primary products experience a high degree of volatility, which seems to be connected to industrialization in the center. Finally, these phases of disinflation are accompanied by rapid technological technological progress, particularly in transportation, which tends to enable the periphery to gain increasing access to central markets. The U.S. cycle described above fits these broad outlines fairly well.

We may note, then, that as long as the British were able to hold their

place in international trade and finance, they were successfully able to avoid a balance of payments constraint on output growth, even under a gold standard system. While the U.S. was not during the first half of the century, as noted in Chapter 3 of this work, the constraint was increasingly irrelevant. As the constraint became lifted, domestic demand was increasingly relevant as the primary constraint on growth. We can say, then, following Vernengo (2006), that the U.S., along with much of the periphery was characterized by financial dependency. What is particularly interesting about the U.S. case was that it eventually escaped such cycles while many of the countries of Latin America (some of whom gained their independence at roughly the same time) not only experienced these cycles throughout the 19th century, but witnessed their return after the 1980s. The U.S. development over the course of the century then offers an instructive lesson for current development economics.

CHAPTER 5

CONCLUSION

In the chapters above, I have argued three related themes. First, the so-called "developmental" state played a significant role in long run U.S. growth. That is, the orientation of the state toward domestic development should be included among the fundamental causes of growth. The role for the state makes sense when growth is demand led, and in particular when countries are balance of payments constrained in the long run, as argued in Chapter 3. For the U.S., this constraint was relaxed over the 19th century as a result of state efforts. The 1837-1843 crisis can thus be seen as an example of short-run adjustment to a long run balance of payments constrained growth rate. This crisis also suggests that a central feature of the balance of payments constraint is international power and, in particular, international monetary power. Asymmetric adjustment mechansims thus should be a key feature of growth theory, and were certainly central to the antebellum business cycle.

The hope of this dissertation is that the preceding pages have provided an initial foray into an explicitly classical-Keynesian version of economic history. I have argued that this tradition and its reversal of the causalities of mainstream economics has a great deal to offer the study of economic history. Though this potential has existed for some time, work

amongst those in the "heterodox" schools has not exploited them. An exception should be noted for a handful of Marxist economists, though they have, in many cases, found themselves on the same side (at least superficially) as mainstream authors in terms of the causal mechanisms referenced above.[1] The potential for historical insight exists not simply because the classical-Keynesian tradition reverses causation in its "core" equations, but because it is in essence an "open" system. The explanation of distributive shares, the accumulation process, and their relationship as envisioned by the classical-Keynesian system cannot be considered closed without the contribution of history.

The areas in which heterodox authors can make historical contributions are seemingly endless. In the context of U.S. history, monetary issues have been a dominant political concern since the colonial era, but the endogenous money theorists have been silent on them until the early 20th century. The income flows between the plantation south, midwest, northeast, and mid-Atlantic very nearly cry out for a structuralist treatment. Similarly, long run price cycles have not been analyzed from the perspective of cost-push or distributive conflict inflation. Estimates of growth rates may perhaps be revised in light of plausible spending elasticities.

Perhaps most importantly, the histories of currently developed countries offer a great deal of insight for development economists, a notion recently revived by Chang (2002) and Bairoch (1998) among others, though it has a long ways to go. While dependency authors looked to the colonial roots of technological dependency, they did so without a thorough comparison to

[1] See Acemoglu et al. (2001) for a passing reference to some of the similarities in class analysis. Dutt (2011) argues that many macroeconomic models inspired by Marxian schemes of reproduction adhere to Say's Law in the long run. Though it is true that many Marxists have taken effective demand seriously, there is scant evidence of this in their historical work.

the colonial roots of technological independence and dominance. Finally, the historical roots of financial dominance and so-called “original sin” have been almost completely ignored. These issues are only the beginning of what is clearly a very long list. One hopes that as heterodox economics further matures, it attempts to strengthen its connection to the historical record.

APPENDIX

In light of the dependency cycle described above, we can then construct a parsimonious and stylized model of the crisis as follows. The growth rate of the debt of states (federal debt is assumed extinguished) follows well-known rules of debt dynamics. That is, as established by Domar (1944), the growth rate of debt to GDP will depend not only on new borrowing, but on the relationship between the real interest rate and the growth rate of domestic income. In addition, da Silva and Vernengo (2007) point out that for countries who must borrow in foreign currency, the exchange rate is also relevant. Thus,we can write a version of "least controversial equation in macroeconomics" (Hall & Sargent, 2010) which describes the dynamics of external debt.

$$\dot{d} = \frac{(G-T)}{Y} + (i_{us}e - g_{us} - \frac{\dot{P}_c}{P_c})d \tag{5.1}$$

where d is debt to income, $G-T$ is state level deficits, Y is current income, i is the interest rate, g is the rate of growth of income, P_c is the price of commodities (in this case, primarily cotton), and e is the exchange rate (pounds per dollar). Dots represent the time derivative of a variable. That is, the change in debt to income is the result of changes in the primary deficit, but also the interest rate, growth rate of income, inflation, and the exchange rate. In this case, I have assumed that all debt is external (and thus subject to fluctuations in the exchange rate). This implies that

the relevant inflation rate is the inflation of exportable commodities prices; thus, the rate of interest is deflated by cotton prices.

In addition, we can describe the growth of income as the result of autonomous demand. In this case, we can separate the growth of exports, and domestic autonomous demand. The growth of exports can be described as:

$$\dot{X}_{us} = xg_B \tag{5.2}$$

where X is exports, and x is the propensity of the British to spend on exports out of income. In addition, the subscripts US and B refer to the United States and Great Britain, respectively. The growth of domestic income can be described as:

$$g_{us} = \alpha(xg_B + z) \tag{5.3}$$

where α is the multiplier, and z is the growth of domestic autonomous demand. In our case, state government expenditures play a large role in these expenditures, as does autonomous consumption and investment. Thus, the growth rate of domestic income is determined in a traditional Keynesian fashion according to the principle of effective demand.

The rate of inflation in commodities is governed by two factors. First, in our time frame, the supply of commodities is likely inelastic; thus, the growth of export demand for commodities will play an important role in price determination. Second, the world commodity trade is financed by British entrepreneurs who will hoard or dip into their commodity stocks in response to cost of financing inventories. Thus, at high interest rates, merchants will release more commodities into the market, and at low interest

rates, merchants will tend to hoard commodities. We can thus write:

$$\frac{\dot{P}_c}{P_c} = \phi(xg_b) - \gamma i_B \tag{5.4}$$

In this case, α reflects the elasticity of prices with respect to demand (or the inverse of the price elasticity of demand) and γ reflects the sensitivity of commodity prices to the interest rate.

The nominal exchange rate (here expressed as pounds per dollar) is determined by the relative interest rates in the U.S. and Britain and relative position of the exchange rate to its long run norm. Finally, the accumulation of external debt may cause a decline in the demand for dollars. Thus, our equation for the evolution of the exchange rate is:

$$\dot{e} = \sigma(i_B - i_{US}) + \theta(\bar{e} - e) + \mu d \tag{5.5}$$

where σ is the interest sensitivity of British demand for dollars, $\bar{e}$ is the long run exchange rate associated with stability under the gold standard, θ is the sensitivity of the demand for dollars to deviations from the long run exchange rate, and finally, μ is the sensitivity of the demand for dollars to the accumulation of foreign debt. Notably absent from our exchange rate equation is the effect of relative prices, which we are assuming are swamped by the other effects. The equation reflects an asset demand view of exchange rate determination, where the right-hand side variables are assumed to affect the demand for dollar denominated assets, rather than underlying fundamentals as in a purchasing power parity or neoclassical monetary models.[2]

Plugging equation (3) into (4), we get:

[2]See Harvey (2001) and Vernengo (2001) for attempts at Keynesian determinations of long run exchange rates.

$$\dot{d} = \frac{(G-T)}{Y} + (i_{US}e - xg_B(\alpha+\phi) - \alpha z + \gamma i_B)d \tag{5.6}$$

which, with equation (5) gives us a system of two dynamic equations. Note that this implies a somewhat different condition for the stability of public debt than is usually assumed. Normally, all that is required for public debt sustainability is that the domestic rate of interest be less than domestic growth. In our case, stability requirements are a bit more stringent. The local stability of the system will depend on the Jacobian below:

$$\begin{bmatrix} -\theta & \mu \\ i_{US}d & (i_{US}e - xg_B(\alpha+\phi) - \alpha z + \gamma i_B) \end{bmatrix} \tag{5.7}$$

Stability requires a positive determinant of the Jacobian. Thus, we get the stability condition:

$$(g_B + z) > \frac{\theta(i_{US}e - \phi g_B + \gamma i_B) + i_{US}d\mu}{\theta\alpha} \tag{5.8}$$

In addition, stability requires the trace to be negative:

$$-\theta + (i_{US}e - xg_b(\alpha+\phi) - \alpha z + \gamma i_B) < 0 \tag{5.9}$$

If the system becomes unstable, debt to GDP growth can become explosive, regardless of current deficits. All else equal stability is more likely when British and domestic autonomous demand growth, and the multiplier are large. Stability is also more likely in the case of low British and U.S. interest rates and low sensitivity of capital flows to debt accumulation. Finally, higher sensitivity of commodity prices to British demand and lower sensitivity to interest rates encourages stability.

In this case, faster British growth makes debt more likely to be sustain-

able to the extent that it increases domestic income, and causes commodity prices to rise. High British or U.S. interest rates (which, as we noted earlier will tend to move together) will make debt less likely to be sustainable, both because of effects on nominal debt accumulation and because of the depressing effect of British interest rates on commodity prices. In addition, a higher initial level of debt to GDP and a higher sensitivity of the exchange rate to the stock of debt will make debt less likely to be sustainable. Finally, a larger multiplier will make debt more likely to be sustainable as will a greater sensitivity of the exchange rate to divergences from the long run rate implied by the gold standard.

In the case of a primary deficit, the system may then be characterized by a stable focus (Figure A.1) or a saddle path (Figure A.2). In the case of the stable focus, debt to GDP is reduced as the growth of GDP (deriving from British and domestic demand) is greater than the interest rate paid on the debt. Indeed, the size of the deficit that will be consistent with a reduction of debt to GDP will actually be larger, the greater the initial stock of debt is. As debt to GDP is reduced, however, the exchange rate appreciation is checked by concerns that it has moved far away from its long run norm. The depreciation that results serves to increase the debt burden, but the time path suggests a movement toward a stable focus level of debt to GDP. In the case of the saddle path, debt to GDP explodes or shrinks depending on the initial level of debt to GDP and the exchange rate.

The model then illustrates the basic outlines of our story. In the expansionary phase of the cycle, high British growth, and low British interest rates (as a result of the Bank of England's policy), create high growth in the U.S., an appreciation of the U.S. exchange rate, and commodity price

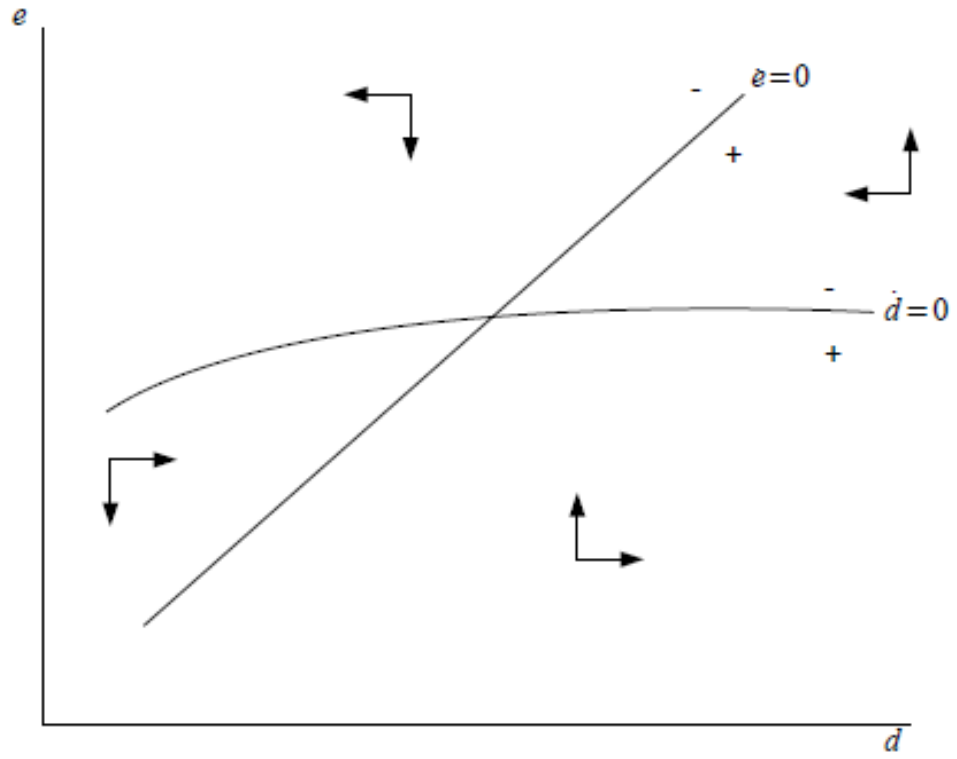


Figure A.1: Stable Focus

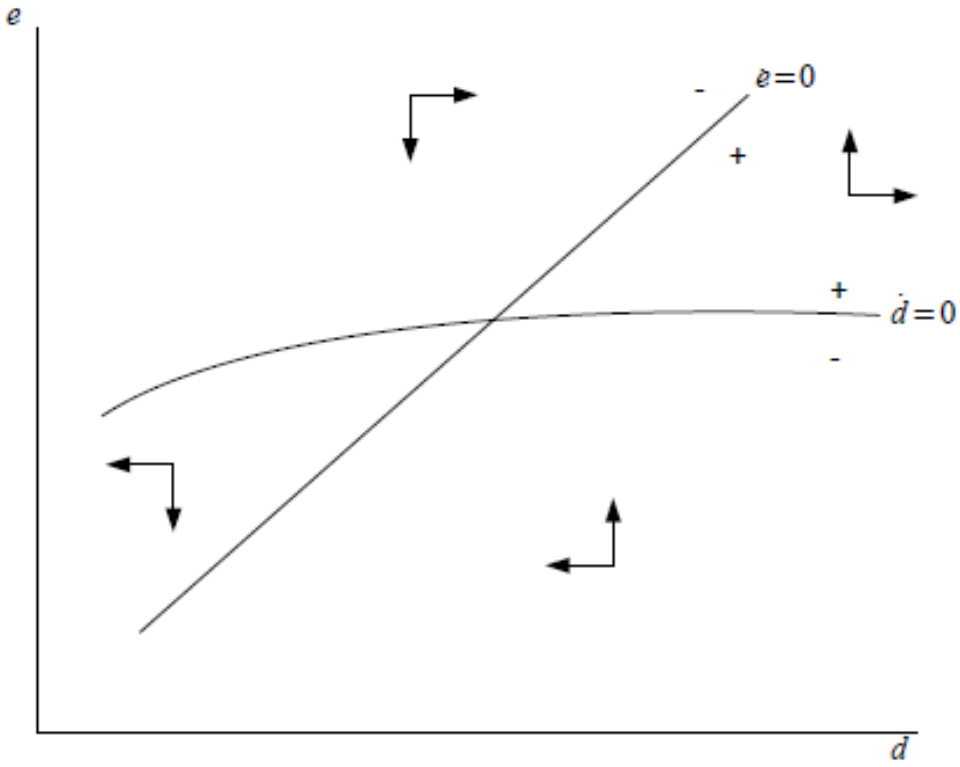


Figure A.2: Saddle Point

inflation. All of these combine to reduce the burden of external debt. We thus find ourselves in the stable focus of Figure A.1.

In the downward phase, however, as British rates rise, U.S. rates follow, and growth rates slow, the curves shift, and the system can be transformed into the saddle path of Figure A.2. That is, as the British interest rate increase (and growth slowdown) tends to come when U.S. economy is in the northeast quadrant, the debt to GDP ratio will explode upward and exchange rates will continually depreciate. Finally, the situation will be worse to the extent that other components of domestic demand (like state government expenditures) are curtailed as a result of a rising debt burden.

A paradoxical result, but one common to debt dynamics models (L. L. Pasinetti, 1997), is that the larger the debt burden the greater the fiscal space when the system is stable. However, once the system becomes unstable, the fiscal space will be smaller the greater the debt burden

REFERENCES

Abramovitz, M., & David, P. (2001). *Two centuries of american macroeconomic growth* (SIEPR Discussion Papers No. 01-05). Stanford, CA: Stanford Institute for Economic Policy Research.

Acemoglu, D., Johnson, S., & Robinson, J. (2002). Reversal of fortune: Geography and institutions in the making of the modern world income distribution. *The Quarterly Journal of Economics*, *117*(4), 1231–1294.

Acemoglu, D., Johnson, S., & Robinson, J. (2005). Institutions as a fundamental cause of long-run growth. In P. Aghion & S. N. Durlauf (Eds.), *Handbook of economic growth* (Vol. 1, pp. 385–472). Amsterdam, Netherlands: Elsevier.

Acemoglu, D., & Robinson, A. (2001). The colonial origins of comparative development: An empirical investigation. *The American Economic Review*, *91*(5), 1369–1401.

Acemoglu, D., & Robinson, J. A. (2012). *Why nations fail: The origins of power, prosperity, and poverty*. New York, New York: Crown Business.

Alesina, A., & Perotti, R. (1996). Income distribution, political instability, and investment. *European Economic Review*, *40*(6), 1203–1228.

Amsden, A. H. (2003). *The rise of "the rest": Challenges to the west from late-industrializing economies*. New York, New York: Oxford University Press, US.

Arrow, K. (1962). The economic implications of learning by doing. *The Review of Economic Studies*, *29*(3), 155–173.

Atack, J., & Passell, P. (1994). *A new economic view of american history: From colonial times to 1940*. New York: Norton.

Baghestani, H., & Mott, T. (2009). On the behaviour of UK money, velocity, prices, and output in the gold standard period: 1871–1913. *Applied Economics*, *41*(10), 1241–1249.

Bahmani-Oskooee, M., & Goswami, G. (2004). Exchange rate sensitivity of Japan's bilateral trade flows. *Japan and the World Economy*, *16*(1), 1–15.

Bairoch, P. (1995). *Economics and world history: Myths and paradoxes*. Chicago, IL: University of Chicago Press.

Balke, N., & Gordon, R. (1989). The estimation of prewar gross national product: Methodology and new evidence. *The Journal of Political Economy*, *97*(1), 38–92.

Barro, R. (2000). Inequality and growth in a panel of countries. *Journal of economic growth*, *5*(1), 5–32.

Bensel, R. F. (1990). *Yankee leviathan: The origins of central state authority in America, 1859-1877*. Cambridge, UK: Cambridge University Press.

Best, M. (1990). *The new competition: Institutions of industrial restructuring*. Cambridge, MA: Harvard University Press.

Bils, M. (1984). Tariff protection and production in the early US cotton textile industry. *The Journal of Economic History*, *44*(04), 1033–1045.

Block, F., & Keller, M. (2011). *State of innovation: The US government's role in technology development and innovation*. Boulder, CO: Paradigm Publishers.

Bloom, D., & Sachs, J. (1998). *Geography, demography, and economic growth in Africa* (Brookings papers on economic activity No. 2). Washington, D.C.: Brookings Institution.

Bloomfield, A. (1963). *Short-term capital movements under the pre-1914 gold standard* (Essays in International Finance No. 215). Princeton, NJ: Princeton University.

Bonney, R. (1999). Introduction. In R. Bonney (Ed.), *The rise of the fiscal state in Europe, c.1200-1815* (pp. 1–18). Oxford, UK: Oxford University Press.

Bordo, M., Meissner, C., & Redish, A. (2003). *How "original sin" was overcome: The evolution of external debt denominated in domestic currencies in the United States and the British Dominions* (NBER Working Paper No. 9841). Cambridge, MA: National Bureau of Economic Research.

Bordo, M., & Schwartz, A. (1984). The gold standard: The traditional approach. In M. D. Bordo & A. J. Schwartz (Eds.), *A retrospective*

on the classical gold standard, 1821-1931 (pp. 23–120). Chicago, IL: University of Chicago Press.

Bortis, H. (1997). *Institutions, behaviour, and economic theory: A contribution to classical-Keynesian political economy*. Cambridge, UK: Cambridge University Press.

Braudel, F. (1980). *On history*. Chicago, IL: The University of Chicago Press.

Braudel, F. (1984). *Civilization and capitalism, 15th-18th century: The perspective of the world*. New York, New York: Harper and Row.

Brewer, J. (1990). *The sinews of power: War, money, and the English state, 1688-1783*. Cambridge, MA: Harvard University Press.

Britto, G., & McCombie, J. (2009). Thirlwall's law and the long-term equilibrium growth rate: an application to Brazil. *Journal of Post Keynesian Economics*, *32*(1), 115–136.

Caldentey, E. P. (2008). The concept and evolution of the developmental state. *International Journal of Political Economy*, *37*(3), 27-53.

Camara-Neto, A. F., & Vernengo, M. (2010). *Keynes after Sraffa and Kaldor: Effective demand, accumulation and productivity growth* (Department of Economics Working Paper Series No. 2010-07). University of Utah.

Cardoso, F., & Faletto, E. (1979). *Dependency and development in latin america*. Berkley, CA: University of California Press.

CDC. (2012, June). *Malaria.* Retrieved 7/30/12, from `http://www.cdc.gov/MALARIA/`

Centeno, M. A. (1997). Blood and debt: War and taxation in nineteenth-century Latin America. *American Journal of Sociology*, *102*(6), 1565-1605.

Cesaratto, S. (1999). Critical survey: Savings and economic growth in neoclassical theory. *Cambridge Journal of Economics*, *23*(6), 771-793.

Chang, H. (2002). *Kicking away the ladder: Development strategy in historical perspective*. New York, New York: Anthem Press.

Chirinko, R. (1993). Business fixed investment spending: Modeling strategies, empirical results, and policy implications. *Journal of Economic Literature*, *31*(4), 1875–1911.

Clapham, J. (1945). *The bank of England: A history*. Cambridge, UK: Cambridge University Press.

Clemens, M., & Williamson, J. (2001). A tariff-growth paradox? protection's impact the world around 1875-1997. *NBER Working Papers*.

Clemente, J., Montañes, A., & Reyes, M. (1998). Testing for a unit root in variables with a double change in the mean. *Economics Letters*, *59*(2), 175–182.

Coase, R. (1960). The problem of social cost. *Journal of Law and Economics*, *3*, 1-44.

Coase, R. H. (1937). The nature of the firm. *Economica*, *4*(16), 386-405.

Coase, R. H. (1959). The federal communications commission. *Journal of Law and Economics*, *2*, 1-40.

Cohen, B. J. (1998). *The geography of money*. Ithaca, NY: Cornell University Press.

Commendatore, P., D'Acunto, S., Panico, C., & Pinto, A. (2003). Keynesian theories of growth. In N. Salvadori (Ed.), *The theory of economic growth: A 'classical' perspective* (pp. 103–138). Cheltenham, UK: Edward Elgar.

Commons, J. (1966). *History of labor in the united states*. New York: Augustus Kelley Publishers.

Crafts, N. (2009). Solow and growth accounting: A perspective from quantitative economic history. *History of Political Economy*, *41*(Supplement 1), 200.

da Silva, C., & Vernengo, M. (2007). *Foreign exchange, interest and the dynamics of public debt in Latin America* (Department of Economics Working Paper No. 2007-2). University of Utah.

David, P. (1967). The growth of real product in the United States before 1840: New evidence, controlled conjectures. *Journal of Economic History*, *27*(2), 151–197.

David, P. (1973). The horndal effect in Lowell, 1834-1856: A short-run learning curve for integrated cotton textile mills. *Explorations in Economic History*, *10*(2), 131–150.

David, P. (1985). Clio and the economics of qwerty. *The American Economic Review*, *75*(2), 332-337.

David, P., & Solar, P. (1977). A bicentenary contribution to the history of the cost of living in America. *Research in Economic History*, *2*(5), 1–80.

Davis, L., & Cull, R. (1994). *International capital markets and American economic growth, 1820-1914*. Cambridge, UK: Cambridge University Press.

Davis, L., & Stettler, H. (1966). The New England textile industry, 1825-60: Trends and fluctuations. In D. S. Brady (Ed.), *Output, employment, and productivity in the united states after 1800* (pp. 213 – 242). Cambrdige, MA: NBER.

Dawson, F. (1990). *The first Latin American debt crisis: the city of London and the 1822-25 loan bubble*. New Haven, CT: Yale University Press.

Deane, P. (1979). *The first industrial revolution*. Cambridge, UK: Cambridge University Press.

De Cecco, M. (1974). *Money and empire: The international gold standard, 1890-1914*. Hoboken, New Jersey: Blackwell.

Dell, M., Jones, B., & Olken, B. (2008). *Climate change and economic growth: Evidence from the last half century* (NBER Working Paper No. 14132). Cambridge, MA: National Bureau of Economic Research.

De Medeiros, C. (2003). The post-war american technological development as a military enterprise. *Contributions to Political Economy*, *22*(1), 41-62.

De Montesquieu, C. (2011). *The spirit of laws*. New York, New York: Cosimo Classics.

Demsetz, H. (1967). Toward a theory of property rights. *The American Economic Review*, *57*(2), 347-359.

Diamond, J. (1997). *Guns, germs, and steel*. New York, New York: WW Norton & Company.

Domar, E. (1944). The "burden of the debt" and the national income. *The American Economic Review*, *34*(4), 798-827.

Domar, E. (1950). The effect of foreign investment on the balance of payments. *The American Economic Review*, *40*(5), 805-826.

Dutt, A. (2011). The role of aggregate demand in classical-marxian models of economic growth. *Cambridge Journal of Economics*, *35*(2), 357–

382.

Eatwell, J. (1983). The long-period theory of employment. *Cambridge Journal of Economics*, *7*(3-4), 269-85.

Edelstein, M. (2006). International transactions and foreign commerce. In S. B. Carter, S. S. Gartner, M. R. Haines, A. L. Olmstead, R. Sutch, & G. Wright (Eds.), *Historical statistics of the United States, earliest times to the present: Millennial edition* (pp. 5-441–5-444). Cambridge, UK: Cambridge University Press.

Edling, M. (2003). *A revolution in favor of government: Origins of the US constitution and the making of the American state*. Oxford, UK: Oxford University Press.

Egnal, M. (1975). The economic development of the thirteen continental colonies, 1720 to 1775. *The William and Mary Quarterly*, *32*(2), 192-222.

Eichengreen, B. (1992). The origins and nature of the great slump revisited. *The Economic History Review*, *45*(2), 213–239.

Eichengreen, B. (1998). *Globalizing capital: A history of the international monetary system*. Princeton, NJ: Princeton University Press.

Eichengreen, B. (2011). *Exorbitant privilege: the rise and fall of the dollar and the future of the international monetary system*. Oxford, UK: Oxford University Press.

Eichengreen, B., & Hausmann, R. (1999). *Exchange rates and financial fragility* (NBER Working Paper No. 7418). National Bureau of Economic Research.

Engerman, S. (1977). Douglass c. North's the economic growth of the United States, 1790-1860 revisited. *Social Science History*, *1*(2), 248-257.

Esteban, J. (1997). The rising share of British industrial exports in industrial output, 1700-1851. *The Journal of Economic History*, *57*(4), 879-906.

Esteban, J. (2001). The British balance of payments, 1772-1820: India transfers and war finance. *The Economic History Review*, *54*(1), 58–86.

Ferguson, N. (2008). *The ascent of money: A financial history of the world*. London, UK: Penguin Press.

Ford, A. (1958). The transfer of British foreign lending, 1870-1913. *The Economic History Review*, *11*(2), 302-308.

Ford, A. (1964). Bank rate, the British balance of payments, and the burdens of adjustment, 1870-1914. *Oxford Economic Papers*, *16*(1), 24-39.

Ford, A. (1983). *The gold standard, 1880-1914: Britain and Argentina*. New York, New York: Garland Publishing.

Frankel, H. (1946). The Jackson period. *Fourth International*, *7*(12), 365-368.

Frankel, M. (1962). The production function in allocation and growth: a synthesis. *The American Economic Review*, *52*(5), 996-1022.

Friedman, G. (2001). *The sanctity of property in American history* (PERI Working Paper No. 14). Amherst, MA: Political Economy Research Institute.

Friedman, M., & Schwartz, A. (1971). *A monetary history of the United States, 1867-1960*. Princeton, NJ: Princeton University Press.

Furtado, C. (1968). *The economic growth of Brazil: A survey from colonial to modern times*. Berkeley, CA: University of California Press.

Garegnani, P. (1976). On a change in the notion of equilibrium in recent work on value. In M. Brown, K. Sato, & P. Zarembka (Eds.), *Essays in modern capital theory* (pp. 25–45). Amsterdam, Netherlands: North Holland.

Garegnani, P. (1979). Notes on consumption, investment and effective demand: Ii. *Cambridge Journal of Economics*, *3*(1), 63–82.

Garegnani, P. (2000). Savings, investment and capital in a system of general intertemporal equilibrium. In H. Kurz (Ed.), *Critical essays on piero sraffa's legacy in economics* (pp. 392–445). Cambridge, UK: Cambridge University Press.

Garegnani, P., & Palumbo, A. (1999). Accumulation of capital. In H. Kurz & N. Salvadori (Eds.), *The elgar companion to classical economics* (pp. 47–71). Cheltenham, UK: Edward Elgar.

Gerschenkron, A. (1962). *Economic backwardness in historical perspective*. Cambridge, MA: Harvard University Press.

Ghosh, S. (2009). Import demand of crude oil and economic growth: Evi-

dence from india. *Energy Policy*, *37*(2), 699–702.

Gilboy, E. (1967). Demand as a factor in the industrial revolution. In R. Hartwell (Ed.), *The causes of the industrial revolution in England* (pp. 121–138). London, UK: Methuen.

Ginzburg, A., & Simonazzi, A. (2011). Disinflation in industrialized countries, foreign debt cycles and the costs of stability. In R. Ciccone, C. Gehrke, & G. Mongiovi (Eds.), *Sraffa and modern economics* (Vol. II, pp. 269–296). New York, New York: Routledge.

Goldin, C., & Lewis, F. (1980). The role of exports in American economic growth during the Napoleonic wars, 1793 to 1807. *Explorations in Economic History*, *17*(1), 6-25.

Goldin, C., & Margo, R. (1992). Wages, prices, and labor markets before the Civil War. In C. Goldin & H. Rockoff (Eds.), *Strategic factors in nineteenth century American economic history: A volume to honor Robert W. Fogel* (pp. 67–104). Chicago, IL: University of Chicago Press.

Goldin, C., & Sokoloff, K. (1984). The relative productivity hypothesis of industrialization: The American case, 1820 to 1850. *The Quarterly Journal of Economics*, *99*(3), 461-487.

Goodhart, C. A. (1998). The two concepts of money: Implications for the analysis of optimal currency areas. *European Journal of Political Economy*, *14*(3), 407-432.

Hall, G., & Sargent, T. (2010). Interest rate risk and other determinants of post-WWII US government debt/gdp dynamics. *American Economic Journal: Macroeconomics*, *3*(3), 192-214.

Hammond, B. (1991). *Banks and politics in America from the revolution to the Civil War*. Princeton, NJ: Princeton University Press.

Harcourt, G. C. (1972). *Some Cambridge controversies in the theory of capital*. Cambridge, UK: Cambridge University Press.

Harley, C. (1992). The antebellum American tariff: Food exports and manufacturing. *Explorations in Economic History*, *29*(4), 375–400.

Harley, C. (2004). Trade: Discovery, mercantilism and technology. In *The Cambridge economic history of Britain since 1700* (Vol. 1, pp. 175–202). Cambridge, UK: Cambridge University Press.

Harrison, L., & Huntington, S. (2000). *Culture matters: How values shape human progress*. New York, New York: Basic Books.

Harvey, J. (2001). Exchange rate theory and" the fundamentals". *Journal of Post Keynesian Economics*, *24*, 3–15.

Hawtrey, R. (1965). *A century of bank rate*. New York, New York: Kelly.

Helleiner, E. (1999). Historicizing territorial currencies: Monetary space and the nation-state in North America. *Political Geography*, *18*(3), 309-339.

Henn, H. (1953). The quest for international copyright protection. *Cornell Law Quarterly*, *39*, 43.

Hounshell, D. (1985). *From the American system to mass production, 1800-1932: The development of manufacturing technology in the United States*. Baltimore, MD: Johns Hopkins University Press.

Huffman, W. E., & Lothian, J. R. (1984). The gold standard and the transmission of business cycles, 1833-1932. In M. D. Bordo & A. J. Schwartz (Eds.), *A retrospective on the classical gold standard, 1821-1931* (pp. 455–512). Chicago, IL: University of Chicago Press.

Imlah, A. (1950). The terms of trade of the United Kingdom, 1798-1913. *The Journal of Economic History*, *10*(2), 170-194.

Innis, H. (1967). *The fur trade in Canada: An introduction to Canadian economic history*. Toronto, Canada: University of Toronto Press.

Irwin, D. (2000). Did late-nineteenth-century US tariffs promote infant industries? evidence from the tinplate industry. *Journal of Economic History*, *60*(2), 335–360.

Irwin, D. (2002). Interpreting the tariff-growth correlation of the late 19th century. *American Economic Review*, *92*(2), 165–169.

Irwin, D. (2004). The aftermath of Hamilton's "report on manufactures". *The Journal of Economic History*, *64*(3).

Irwin, D., & Temin, P. (2001). The antebellum tariff on cotton textiles revisited. *Journal of Economic History*, *61*(3), 777–798.

Isham, J., & Kaufmann, D. (1999). The forgotten rationale for policy reform: The productivity of investment projects. *The Quarterly Journal of Economics*, *114*(1), 149–184.

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica*, *59*(1), 1551–1580.

John, R. R. (1997). Governmental institutions as agents of change: Rethinking American political development in the early republic, 1787-1835. *Studies in American Political Development*, *11*(Fall), 347–380.

John, R. R. (2006). Ruling passions: Political economy in nineteenth-century America. *Journal of Policy History*, *18*(1), 1–20.

Johnston, L., & Williamson, S. (2007). *What was the us gdp then?* Retrieved 06/01/12, from `MeasuringWorth. com`

Kaldor, N. (1966). *Causes of the slow rate of economic growth of the United Kingdom*. Cambridge, UK: Cambridge University Press.

Kaldor, N. (1970). The case for regional policies. *Scottish Journal of Political Economy*, *17*(3), 337-348.

Kaldor, N. (1977). Capitalism and industrial development: Some lessons from Britain's experience. *Cambridge Journal of Economics*, *1*(2), 193-204.

Kaldor, N. (1996). *Causes of growth and stagnation in the world economy*. Cambridge, UK: Cambridge University Press.

Keynes, J. (1997). *The general theory of interest, employment and money*. Amherst, NY: Prometheus.

Kirshner, J. (1997). *Currency and coercion: The political economy of international monetary power*. Princeton, NJ: Princeton University Press.

Knodell, J. (1998). The demise of central banking and the domestic exchanges: Evidence from antebellum Ohio. *The Journal of Economic History*, *58*(3), 714-730.

Knodell, J. (2006). Rethinking the Jacksonian economy: The impact of the 1832 bank veto on commercial banking. *Journal of Economic History*, *66*(3), 541-574.

Koffka, K. (1935). *Principles of Gestalt psychology*. New York, New York: Harcourt.

Kravis, I. (1972). The role of exports in nineteenth-century United States growth. *Economic Development and Cultural Change*, *20*(3), 387–405.

Lamoreaux, N. (2011). The mystery of property rights: A US perspective. *The Journal of Economic History*, *71*(2), 275-306.

Landes, D. (1969). *The unbound prometheus: Technological change and*

industrial development in Western Europe from 1750 to the present. Cambridge, UK: Cambridge University Press.

Landes, D. (1999). *The wealth and poverty of nations: Why some are so rich and some so poor*. New York, New York: WW Norton & Company.

Landes, D. (2000). Culture makes almost all the difference. In L. Harrison & S. Huntington (Eds.), *Culture matters: How values shape human progress* (pp. 2–13). New York, New York: Basic Books.

La Porta, R., Lopez-de Silanes, F., & Shleifer, A. (2007). *The economic consequences of legal origins* (NBER Working Paper No. 13608). National Bureau of Economic Research.

Laurie, B. (1980). *Working people of Philadelphia, 1800-1850*. Philadelphia, Pennsylvania: Temple University Press.

Leonardi, R., Nanetti, R., & Putnam, R. (1993). *Making democracy work: Civic traditions in modern Italy*. Princeton, NJ: Princeton University Press.

Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion & S. Durlauf (Eds.), *Handbook of economic growth* (Vol. 1, pp. 865–934). Amsterdam, Netherlands: Elsevier.

Lewis, W. (1954). Development with unlimited supplies of labour. *The Manchester School*, *22*(2), 139–191.

Lindstrom, D. (1983). Macroeconomic growth: The United States in the nineteenth century. *Journal of Interdisciplinary History*, *13*(4), 679-705.

Lipsey, R. (1963). *Price and quantity trends in the foreign trade of the United States*. Cambridge, MA: National Bureau of Economic Research.

Lipsey, R. (2000). US foreign trade and the balance of payments, 1800-1913. In S. Engerman & R. Gallman (Eds.), *Cambridge economic history of the United States* (Vol. 2, pp. 685–732). Cambridge, UK: Cambridge University Press.

Lively, R. (1955). The American system: A review article. *The Business History Review*, *29*(1), 81-96.

Maddison, A. (1988). Ultimate and proximate growth causality: A critique of Mancur Olson on the rise and decline of nations. *Scandinavian Economic History Review*, *36*(2), 25–29.

Margo, R. (2000). The labor force in the nineteenth century. In S. Engerman & R. Gallman (Eds.), *The Cambridge economic history of the United States* (Vol. 2, pp. 207–244). Cambridge, UK: Cambridge University Press.

Margo, R., & Villaflor, G. (1987). The growth of wages in antebellum America: New evidence. *Journal of Economic History*, *47*(4), 873-895.

Marx, K. (1967). *The eighteenth brumaire of Louis Bonaparte*. Moscow, Soviet Union: Progress Publishers.

Marx, K. (1976). *Capital, vol. 1* (Vol. 1). Moscow, Soviet Union: Progress Publishers.

Matthews, R. (1954). *A study in trade-cycle history*. Cambridge, UK: Cambridge University Press.

Maxfield, S. (1990). *Governing capital: International finance and Mexican politics*. Ithaca, NY: Cornell University Press.

McCombie, J., & Thirlwall, A. (1994). *Economic growth and the balance-of-payments constraint*. New York, New York: St. Martin's Press.

McCormick, R. (1973). *The second American party system: Party formation in the Jacksonian era*. New York, New York: WW Norton & Company.

McGrane, R. (1924). *The panic of 1837: Some financial problems of the Jacksonian era*. Chicago, IL: The University of Chicago Press.

McGrane, R. (1935). *Foreign bondholders and American state debts*. New York, New York: Macmillan.

Milgate, M. (1979). On the origin of the notion of "intertemporal equilibrium". *Economica*, *46*(181), 1–10.

Mitchener, K., & Weidenmier, M. (2007). *The Baring crisis and the great Latin American meltdown of the 1890s* (NBER Working Paper No. 13403). National Bureau of Economic Research.

Modigliani, F. (1944). Liquidity preference and the theory of interest and money. *Econometrica*, *12*(1), 45–88.

Mokyr, J. (1977). Demand vs. supply in the industrial revolution. *Journal of Economic History*, *37*(4), 981-1008.

Moreno-Brid, J. (1999). Mexico's economic growth and the balance of payments constraint: A cointegration analysis. *International Review*

of Applied Economics, *13*(2), 149-159.

Moreno-Brid, J. (2003). Capital flows, interest payments and the balance-of-payments constrained growth model: A theoretical and empirical analysis. *Metroeconomica*, *54*(2-3), 346-365.

Myrdal, G. (1976). The meaning and validity of institutional economics. In K. Dopfer (Ed.), *Economics in the future: Towards a new paradigm* (pp. 85–103). London, UK: Macmillan.

Narayan, S., & Narayan, P. (2005). An empirical analysis of Fiji's import demand function. *Journal of Economic Studies*, *32*(2), 158-168.

Narayan-Parker, D. (1998). *Voices of the poor: Poverty and social capital in Tanzania*. Washington, D.C.: World Bank Publications.

Nelson, C., & Plosser, C. (1982). Trends and random walks in macroeconmic time series: Some evidence and implications. *Journal of Monetary Economics*, *10*(2), 139-162.

Nelson, R. (1956). A theory of the low-level equilibrium trap in underdeveloped economies. *The American Economic Review*, *46*(5), 894-908.

North, D. (1961). *The economic growth of the United States, 1790-1860*. Englewood Cliffs, N.J: Prentice-Hall.

North, D. (1991). Institutions. *The Journal of Economic Perspectives*, *5*(1), 97-112.

North, D., & Thomas, R. (1973). *The rise of the Western world: A new economic history*. Cambridge, UK: Cambridge University Press.

North, D. C. (1981). *Structure and change in economic history*. New York, New York: WW Norton & Company.

Novak, W. (2008). The myth of the "weak" American state. *The American Historical Review*, *113*(3), 752-772.

Nurkse, R. (1944). *International currency experience: Lessons of the inter-war period*. Geneva, Switzerland: League of Nations.

O'brien, P. K. (2007). State formation and the construction of institutions for the first industrial nation. In H. Chang (Ed.), *Institutional change and economic development* (pp. 177–198). New York, New York: United Nations University Press.

O'Rourke, K. (2000). Tariffs and growth in the late 19th century. *The*

Economic Journal, *110*(463), 456-483.

Pasinetti, L., & Scazzieri, R. (1990). Capital theory: Paradoxes. In J. Eatwell & M. Milgate (Eds.), *The new palgrave: Capital theory* (pp. 136–147). New York, New York: W. W. Norton & Co.

Pasinetti, L. L. (1997). The social burden of high interest rates. In P. Arestis, G. Palma, & M. Sawyer (Eds.), *Capital controversy, post-Keynesian economics, and the history of economics: Essays in honour of geoff harcourt* (Vol. 1, pp. 149–156). London, UK: Routledge.

Perron, P., & Vogelsang, T. (1992). Nonstationarity and level shifts with an application to purchasing power parity. *Journal of Business & Economic Statistics*, *10*(3), 301-320.

Pesaran, M., Shin, Y., & Smith, R. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289-326.

Phelps Brown, E., & Ozga, S. (1955). Economic growth and the price level. *The Economic Journal*, *65*(257), 1-18.

Pigou, A. (1943). The classical stationary state. *The Economic Journal*, *53*(212), 343-351.

Poggi, G. (1978). *The development of the modern state: A sociological introduction*. Stanford, CA: Stanford University Press.

Polanyi, K. (1957). *The great transformation*. Boston, MA: Beacon Press.

Pollack, S. D. (2009). *War, revenue, and state building: Financing the development of the American state*. Ithaca, NY: Cornell University Press.

Ratchford, B. (1941). *American state debts*. Durham, North Carolina: Duke University Press.

Reinert, E. S., & Reinert, S. A. (2005). Mercantilism and economic development. In J. K.S. & E. S. Reinert (Eds.), *The origins of development economics: How schools of economic thought have addressed development* (pp. 1–23). New York, New York: St. Martin's Press.

Rezneck, S. (1935). The social history of an American depression, 1837-1843. *The American Historical Review*, *40*(4), 662-687.

Rhode, P. W., & Sutch, R. (2006). Estimates of national product before 1929. In S. B. Carter, S. S. Gartner, M. R. Haines, A. L. Olmstead,

R. Sutch, & G. Wright (Eds.), *Historical statistics of the United States, earliest times to the present: Millennial edition* (pp. 3-12–3-20). Cambridge, UK: Cambridge University Press.

Ringer, B. (1968). The role of the United States in international copyright: Past, present, and future. *Georgetown Law Jounral*, *56*(1050).

Rochon, L., & Vernengo, M. (2003). State money and the real world: Or chartalism and its discontents. *Journal of Post Keynesian Economics*, *26*(1), 57-67.

Rockoff, H. (1971). Money, prices, and banks in the Jacksonian era. In R. Fogel & S. Engerman (Eds.), *The reinterpretation of American economic history* (pp. 448–467). New York, New York: Harper & Row.

Romer, D. (2003). Misconceptions and political outcomes. *The Economic Journal*, *113*(484), 1-20.

Romer, P. (1994). The origins of endogenous growth. *The Journal of Economic Perspectives*, *8*(1), 3-22.

Rousseau, P. (2002). Jacksonian monetary policy, specie flows, and the panic of 1837. *The Journal of Economic History*, *62*(2), 457-488.

Rousseau, P., & Sylla, R. (2005). Emerging financial markets and early US growth. *Explorations in Economic History*, *42*(1), 1-26.

Sachs, J. (2001). *Tropical underdevelopment* (NBER Working Paper No. 8119). National Bureau of Economic Research.

Sayers, R. (1976). *The bank of England, 1891-1944* (Vol. 3). Cambridge, UK: Cambridge University Press.

Schlesinger, A. M. (1971). *The age of Jackson*. Old Saybrook, CT: Konecky & Konecky.

Schumpeter, J. (1954). The crisis of the tax state. *International Economic Papers*, *4*(7).

Serrano, F. (2003). From 'static' gold to the floating dollar. *Contributions to Political Economy*, *22*(1), 87-102.

Simon, M. (1960). The United States balance of payments, 1861-1900 [NBER Chapters]. In *Trends in the American economy in the nineteenth century* (p. 629-716). Ann Arbor, MI: UMI.

Smith, M. (2001). Endogenous money, interest and prices: Tooke's mon-

etary thought revisited. *Contributions to Political Economy*, *20*(1), 31-55.

Sokoloff, K., & Engerman, S. (2000). History lessons: Institutions, factors endowments, and paths of development in the new world. *The Journal of Economic Perspectives*, *14*(3), 217-232.

Sutch, R. (2006a). Gross domestic product: 1790-2002 [continuous annual series]. In S. B. Carter, S. S. Gartner, M. R. Haines, A. L. Olmstead, R. Sutch, & G. Wright (Eds.), *Historical statistics of the United States, earliest times to the present: Millennial edition* (pp. 3-23–3-28). Cambridge, UK: Cambridge University Press.

Sutch, R. (2006b). National income and product. In S. B. Carter, S. S. Gartner, M. R. Haines, A. L. Olmstead, R. Sutch, & G. Wright (Eds.), *Historical statistics of the United States, earliest times to the present: Millennial edition* (pp. 3-3–3-6). Cambridge University Press.

Suter, C. (1992). *Debt cycles in the world-economy*. Boulder, CO: Westview Press.

Sylla, R. (1982). Monetary innovation in america. *The Journal of Economic History*, *42*(1), 21-30.

Sylla, R. (1999). Shaping the US financial system, 1690-1913: The dominant role of public finance. In R. Sylla, R. Tilly, & G. Casares (Eds.), *The state, the financial system, and economic modernization* (pp. 249–270). Cambridge, UK: Cambridge University Press.

Sylla, R. (2001). The United States: Financial innovation and adaptation. In M. Bordo & R. Cortés-Conde (Eds.), *Transferring wealth and power from the old to the new world: Monetary and fiscal institutions in the 17th through the 19th centuries* (pp. 231–258). Cambridge, UK: Cambridge University Press.

Taussig, F. (1931). *Some aspects of the tariff question: An examination of the development of American industries under protection*. New York, New York: A.M. Kelly.

Taylor, L. (1983). *Structuralist macroeconomics: Applicable models for the third world*. New York, New York: Basic Books.

Temin, P. (1969). *The Jacksonian economy*. New York, New York: W. W. Norton & Co.

Temin, P. (1976). *Did monetary forces cause the great depression?* New

York, New York: W. W. Norton & Co.

Thirlwall, A. (1979). The balance of payments constraint as an explanation of international growth rate differences. *PSL Quarterly Review*, *32*(128), 45-53.

Thirlwall, A., & Hussain, M. (1982). The balance of payments constraint, capital flows and growth rate differences between developing countries. *Oxford Economic Papers*, *34*(3), 498–510.

Tilly, C. (1984). *Big structures, large processes, huge comparisons*. New York, New York: Russell Sage Foundation Publications.

Tilly, C., & Ardant, G. (1975). *The formation of national states in Western Europe*. Princeton, NJ: Princeton University Press.

Tobin, J. (1965). The monetary interpretation of history. *The American Economic Review*, *55*(3), 464-485.

Tooke, T. (1959). *An inquiry into the currency principle: The connection of the currency with prices, and the expediency of a separation of issue from banking*. London, UK: London School of Economics and Political Science.

Tull, B. (2001). *Springfield armory as industrial policy: Interchangeable parts and the precision corridor*. Unpublished doctoral dissertation, University of Massachussetts, Amherst.

Uzawa, H. (1965). Optimum technical change in an aggregative model of economic growth. *International Economic Review*, *6*(1), 18-31.

Véliz, C. (1994). *The new world of the gothic fox: Culture and economy in English and Spanish America*. Berkeley, CA: University of California Press.

Verdoorn, J. (1993). On the factors determining the growth of labor productivity. In L. Pasinetti (Ed.), *Italian economic papers, vol. 2* (pp. 59–68). Oxford, UK: Oxford University Press.

Vernengo, M. (2001). Foreign exchange, interest and prices: The conventional exchange rate. In M. Vernengo & L. Rochon (Eds.), *Credit, interest rates and the open economy: Essays on horizontalism* (pp. 256–270). Cheltenham, UK: Edward Elgar Publishing.

Vernengo, M. (2006). Technology, finance, and dependency: Latin American radical political economy in retrospect. *Review of Radical Political Economics*, *38*(4), 551-568.

Viner, J. (1965). *Studies in the theory of international trade*. New York, New York: A.M. Kelly.

Wallis, J. (2001). What caused the crisis of 1839? *NBER Historical Working Paper*(133).

Walsh, C. (2008). *Central bank independence.* The New Palgrave Dictionary of Economics Online. New York, New York: Palgram Macmillan. Retrieved from http://www.dictionaryofeconomics.com

Warren, F. . S. H., G.F. & Pearson. (1932). *Wholesale prices for 213 years, 1720 to 1932* (Vol. 142). Ithaca, NY: Cornell University.

Weber, M. (2002). *The Protestant ethic and the "spirit" of capitalism and other writings*. New York, New York: Penguin Classics.

Weiman, D., & James, J. (2007). The political economy of the US monetary union: The civil war era as a watershed. *The American Economic Review*, *97*(2), 271-275.

Weiss, T. (1992). U. S. labor force estimates and economic growth, 1800-1860. In R. E. Gallman & J. J. Wallis (Eds.), *The standard of living in the United States before 1860* (pp. 19–78). Chicago, IL: University of Chicago Press.

Wicksell, K. (1962). *Interest and prices: a study of the causes regulating the value of money*. New York, New York: A.M. Kelly.

Wilentz, S. (1984). Against exceptionalism: Class consciousness and the American labor movement, 1790-1920. *International Labor and Working-Class History*, *26*(1), 1-24.

Wilentz, S. (2006). *The rise of American democracy: Jefferson to Lincoln*. New York, New York: WW Norton & Company.

Wilkins, M. (2004). *The history of foreign investment in the United States, 1914-1945* (Vol. 43). Cambridge, MA: Harvard University Press.

Williamson, J. G. (1964). *American growth and the balance of payments, 1820-1913: A study of the long swing*. Chapel HIll, N.C.: University of North Carolina Press.

Williamson, J. G. (2009). *History without evidence: Latin American inequality since 1491* (NBER Working Paper No. 14766). Cambridge, MA: National Bureau of Economic Research.

Williamson, O. (1993). Contested exchange versus the governance of con-

tractual relations. *The Journal of Economic Perspectives*, *7*(1), 103-108.

Woo-Cummings, M. (Ed.). (1999). *The developmental state*. Ithaca, NY: Cornell University Press.

Woodbury, R. (1960). The legend of Eli Whitney and interchangeable parts. *Technology and Culture*, *1*(3), 235-253.

Young, A. (1928). Increasing returns and economic progress. *The Economic Journal*, *38*(152), 527-542.

Zelizer, V. (1994). *The social meaning of money*. New York, New York: Basic Books.